POPULAR Computing WEEKLY

FREE GAMES CASSETTES

35p 6-12 October 1983 Vol 2 No 40

This Week

Dragon software
Brian Cadge confronts the Ninja Warrior and goes walkabout with Cuthbert in this latest review of Dragon games See page 12

Spectrum radio
Ray Berry presents a selection of radio routines for the 16K Spectrum on page 18

Commodore 64 data
Gary Foreman explains how to create hundreds of data files for records and addresses See page 24

New releases
All the latest software games including *Splat* from Incentive Software, *Computer War* from Thorn EMI and *Door Slammer* from Cathedral Software See page 49

STAR GAME
Asteroid Dodge on BBC B. See page 10.

News Desk

ZX Interface 2 direct by mail

SINCLAIR Research has announced its Rom cartridge and joystick port adaptor for the Spectrum computer

The ZX Interface 2 is available now by mail-order from Sinclair — there is no queuing system for orders such as there is for the ZX Microdrive and Interface 1

Interface 2 is priced at £19.95 while cartridges for it will cost £14.95 The Rom price is more than the original ly suggested £10 tag because the initial numbers manufactured are small

To begin with 10 titles will be available on Rom, all of this are currently available on cassette They are *Backgammon Chess Hungry Horace*, *Horace and the Spiders*, *Planetoids* and *Space Raiders* from Psion and *Psssst!*, *Jet Pac*, *Cookie* and *Tranz Am* from Ultimate

Continued on page 5

It's elementary, Dr Watson

MELBOURNE House's next adventure after the successful *Hobbit* program, is to be based on the *Sherlock Holmes* detective stories

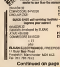
Planned for the beginning of 1984 the new title will be launched simultaneously for Sinclair and Commodore

You play the part of Holmes, trying to find the identity of a murderer Having collected your evidence, you must then convince Inspector Lastrade that you are correct Dr Watson will be your assistant

The plot is not based on any one novel but, according to Fred Milgrom, Melbourne House's founder, the mood of the game has been kept as close as possible to that of the original Conan Doyle books

"In the new adventure we hope to take interaction between the characters a stage further than *The Hobbit* — to the point where it will be possible to hold major conversations with them," he says





Continued on page 43



6-12 October 1983 Vol 2 No 40

SUNSHINE

The Team

Editor
Brandon Gore

News Editor
David Kelly [01 734 2664]

Software Editor
Graham Taylor [01 734 2953]

Production Editor
Lynne Constable

Editorial Secretary
Cleo Cherry

Advertisement Manager
David Lake [01 734 0840]

Advertisement Executive
Alastair Macintosh [01-734 3443]

Classified Executive
Diane Davis [01 734 2688]

Administration
Theresa Lacy [01 734 3454]

Managing Editor
Duncan Scot

Publishing Director
Jenny Ireland

Popular Computing Weekly
12-13 Little Newport Street
London WC2R 3LD
Telephone **01-734 1051**

Published by Sunshine Publications Ltd

Typesetting origination and printing by Chesham Press Chesham Bucks

Distributed by S M Distribution
London SW9 01 274 8611 Telex 261643

ABC
MEMBER OF THE AUDIT BUREAU OF CIRCULATIONS

ISSN 0265-0509

How to submit articles
Articles which are submitted for publication should not be more than 3 000 words long. The articles and any accompanying programs, should be original. It is breaking the law of copyright to copy programs out of other magazines and submit them here — so please do not be tempted.

All submissions should be typed and a double space should be left between each line. Please leave wide margins.

Programs should whenever possible be computer printed.

We cannot guarantee to return every submitted article or program so please keep a copy. If you want to have your own program returned you must include a stamped addressed envelope.

Accuracy
Popular Computing Weekly cannot accept any responsibility for any errors in programs we publish although we will always try our best to make sure programs work.

This Week

Editorial

Acorn Computers and Tottenham Hotspur Football Club make an unlikely combination. However, both Acorn and Spurs went public last week albeit by slightly different routes.

Acorn's decision to join the Unlisted Securities Market is not hard to understand. Like Sinclair, Acorn wanted to raise money to finance future expansion, but without losing control of the company. Placing 10 percent of the shares on the USM will raise several million pounds, but will leave control of the company firmly in the hands of Hermann Hauser and Chris Curry.

With a minimum tender price of 120p per share for the 11,230,172 shares on offer, Acorn is valued at £134 8m — marginally less than the £135 9m figure placed on Sinclair in a private share placement in January.

However, this enthusiasm for microcomputer shares should be tempered with a note of caution. A number of manufacturers have suffered from poor results recently, notably Texas Instruments, NewBrain and Dragon.

The life expectancy of any home micro now being produced is unlikely to be more than two or three years. Consequently, companies such as Sinclair and Acorn are in a vulnarable position. Massive sales for the Spectrum and BBC B this year may not be repeated next year or the year after.

In order to remain successful, both Acorn and Sinclair will have to produce new machines that are competitive with whatever the Japanese or Americans can produce.

Next Thursday

Play Space Invaders for 16K Spectrum by G Cooper In next week s star game


FIREHAWKS
Take flight with Postern

Dragon Data shows off 64K at PCW Show

DRAGON Data has shown its new 64K model publicly for the first time at this year's 6th *Personal Computer World* Show.

The machine is intended to be used in conjunction with the OS9 operating system and Dragon's own disc drives, now at last available in some shops.

The Dragon 64 is similar in appearance to the 32K model, except it is grey in colour and is fitted with an RS232 interface as standard. The machine is scheduled to go on sale on November 1 and will be priced at £225.

The machine is capable of operating in three modes. When switched on it behaves as a 32K machine, all of which is addressable in Basic. The *Exec* command gives Mode 2 — with the Basic relocated above Ram with 41 2K available in Basic (*PClear* gives 48K of Basic user space). Connecting discs and the command *Boot* allows the Basic to be switched out, the OS9 operating system to be loaded from disc and programs from the OS9 system to be run.

OS9 is a multi-tasking system so more than one machine is capable of being connected together, sharing use of the disc unit. The single disc unit, recently on sale, is priced at £275.

The OS9 disc operating system is expected to be ready by the end of November, as will a dual drive unit priced at £399. It is possible that the OS9 will be sold with the disc drives as a combined package.

The attraction of the OS9 system is the selection of software already written which will run under it. Among the packages Dragon plan are the *Dynacalc* spreadsheet (£60), *Stylagraph* word processor with spelling checker and *Mail Merge* letter writing program (£60), *RMS* stock handling program (£55) and a compiled Basic (no price yet) — all scheduled for late November.

All of these packages will run on a single disc system. Those with a dual disc system will also be able to run other languages — Pascal (£75) and C (£75). A disc-based editor/assembler/de-bug program is planned for November. A version of Logo is also planned on cartridge scheduled for the end of December.

● Dragon has now appointed its new managing director — to replace Tony Clarke. He is Brian Moore, from GEC.

Norse myth is revealed

VALHALLA, an animated graphics adventure for the 48K Spectrum, will be available later this month.

Drawing heavily on the ancient Norse myths, Valhalla *consists of six separate quests, each of which must be completed in turn before the next can be attempted. In true* Hobbit *style, you can communicate with the other characters and ask them for help or advice.*

Valhalla *costs £14 95 from Legend, Freepost, 1 Milton Road, Cambridge CB4 1UY.*

Spectrum Interface

Continued from page 1

All Rom cartridges will work with the 16K Spectrum, even if its equivalent cassette version requires the 48K model.

The twin joystick ports on the Interface 2 are standard 9-way D plugs, so most types of joystick should be compatible.

Sinclair has also announced more cassette titles for its range. These are *Chequered Flag* from Psion, *Zeus Assembler* and *Monitor and Disassembler* both from Crystal Computing, *Flippit* from Lez Peranto and *Cattel IQ Test* from Victor Serebriakoff.

Mike Lunch leaves Mattel

MATTEL (UK)'s managing director Mike Lunch, is to leave the company.

His decision comes close on the heels of news of big financial losses for the US parent company (see *Popular Computing Weekly*, September 29).

A spokeswoman for Mattel (UK) confirmed that 'negotiations were in progress with Mike Lunch concerning his relationship with the company'.

Ian Wilson, the company's financial director — acting as managing director following Mike's decision to leave — commented: 'The fact that our parent company is having some problems is well known and to say that they do not affect its subsidiaries would obviously not be true.

'But there is no absolute relation between those problems and the departure of Mike Lunch.'

Following Mattel's heavy losses in the US the company announced reduced support for its Aquarius machine in the North American market.

Mike Lunch

In this country sales of the machine have not lived up to expectations and reports from some dealers now indicate that the company might be considering a substantial price reduction for the computer — possibly lopping as much as £20 off its £80 price.

Acorn shares on the market

ACORN formally announced its intention to join the Unlisted Securities Market last week.

Some 11,230,172 ordinary shares are being offered for sale at a minimum tender price of 120p per share, which capitalises Acorn at £143 8m.

Acorn's turnover in the year to 3 July, 1983 totalled £42 3m, while profits before tax amounted to £8 6m.

Oric is top-seller for French

ORIC Products has announced sales figures for its computers in the UK.

So far the company has sold 21 500 Oric 1 machines in the UK.

Seventy percent of Oric's machines are now sold abroad. Of these, 70 percent go to France, where 35 000 machines have been sold since February.

This makes the Oric 1 the top selling French micro — outselling the Spectrum which went on sale in France in August.

● Tansoft has announced a cut in Oric 1 prices. Until Christmas the 16K machine will be priced at £79 95 and come with a £40-off voucher for the Oric MCP 40 printer. The price of the 48K Oric remains unchanged. The offer only applies to mail-order sales through Tansoft.

Second MTX before first

MEMOTECH has announced a second MTX computer, even before the first has gone on sale.

As well as the £275 32K Ram MTX500 machine there is now to be an MTX512 model with 64K Ram, priced at £315.

The first machines — of both models — are now planned to go on sale in late October.

The MTX500 machine was originally planned for sale in September.

Issue 3 Spectrum . . . 1

It has come to our attention that a number of programs available on the market do not work with the issue three Spectrum which has recently been released

In accordance with our policy of constantly improving our products, we have from time to time made changes to the Spectrum We have always taken care that such changes neither conflict with published documentation nor alter the normal operation of the Spectrum However some software developers have apparently made assumptions about the Spectrum which are completely unsupported and undocumented by us They have assumed that the value in the three high order bits, when a byte is read in from the keyboard uses the *B* command, will always be equal to 1

In the Sinclair ZX Spectrum the bits *D0 – D4* stand for the five keys in the half row being read *D6* is mentioned as being the value of the ear socket while *D5* and *D7* are not mentioned The correct way to read this byte is to mask it to three unused bits so that it is certain that their value is either 0 or 1 The value of the complete byte can then be tested safely as the only variable will be the area relating to the keys

To assume that bits *D5, D6* and *D7* should always be high is extremely unwise, as it is not necessarily so in any Spectrum In issue three Spectrums however, the effect has become more noticeable as bit *D6* is set to zero when there is no signal coming from the tape recorder

We must emphasise that in our view it is extremely dangerous programming practice to assume the value of a bit which is essentially unstable and we strongly recommend all software houses that they re-issue masters for any programs which make assumptions of this kind, as soon as possible

An issue three Spectrum is identifiable as soon as it is connected to a tv, as the image will show up offset to the left of the screen

Sinclair Research Ltd
23 Motcomb Street
London SW1X 8LB

A copy of this letter has already been circulated to about 100 software houses and retailers.

Issue 3 Spectrum . . . 2

I write with reference to your revelation about the issue three Spectrums (*PCW* 15-21 September) and refute Sinclair Research's claim that we are aware of one or two cases where it affects software

I have been going round the bend trying to work out why several of my programs written on my old Spectrum (which developed a fault) wouldn't run on my new replacement These programs use the *In* function in order to read more than one key at the same time and I compile them to make them run faster — *Inkey$* won't compile

The problem occurs when using the *Beep* command and *In* in the same loop — the accompanying program demonstrates the problem audibly

Pressing m gives a regularly spaced *Beep* as does *n* Pressing *Space* gives an irregular random *Beep* Removing the *Beep* statement cures the problem, for instance replacing line 10 with

```
10 IF IN 32766 – 190 THEN BOR
   DER RND*7 REM SPACE KEY
```

After reading your report, I sneaked a look inside my Spectrum sure enough, issue three was printed on the circuit board

Sinclair Research pointed out that some existing software will not work on issue three machines — what about future software?

I don t want an issue three Spectrum, my old one worked fine on my Fidelity tv I don't suppose it's possible to obtain issue two machines any longer but I ll do my best to find one

In conclusion I consider this is a major limitation of the "new" Spectrum and too high a price to pay for increased tv compatibility Hold on to your issue twos, they may be valuable

J S Mellor
87 The Terrace
Torquay
Devon

PS Fortunately, the best Spectrum game ever still works — *Manic Miner* of course Damn those telephones

If it will put your mind at rest, there should be no problems with future software since Sinclair has circulated details of the issue three changes to software houses.

```
10 IF IN 32766=190 THEN BEEP
   .1,6  REM SPACE KEY
20 IF INKEY$="m" THEN BEEP
   .1,0
30 IF PEEK 23560=110 THEN
   BEEP .1,0  REM (last k)..
   .KEY "n"
40 GO TO 10
```

Numerous errors

May I through your letters page appeal for help from your readers?

I have recently constructed a sound generator for the Spectrum, from an article published in another well-known magazine, *Electronics & Computing*

I do not seem to be able to make sense of the circuit diagram, or printed circuit board, due to what appear to be numerous errors

If any of your readers have successfully built a sound generator from this magazine article, or using the AY-3-8912 PSG would they please contact me urgently?

R A Hanslip
28 Mincent Hill
Watcombe
Torquay
TQ2 8DE

High score charts

You have been getting a lot of letters about people's high scores on games such as *Hungry Horace Planetoids* and *Orbiter* Why not include high score charts for a few games?

You could put the high scores near the back with the Top 10 You could include the three aforementioned games and *Manic Miner*, the Ultimate games and perhaps some of the Imagine games We are sure this would be popular

Phil Howarth and
Robert Kirkbride
Stockport
Manchester

PS Our high scores are *Orbiter* — 756,280, *Hungry Horace* — 240,000 (roughly), *Planetoids* – 120 600 (without cheating), *Manic Miner* — 31,323 (sheet 17)

PPS I (Phil) most foolishly bought a Beeb first It broke in two months and is now used for boot-scraping (that is true)!

A hall of fame secion would undoubtedly be popular, but there are two drawbacks — one, there is now way of authenticating high scores and two, it is very difficult to decide which games to include and which to leave out.

BBC Syndrome

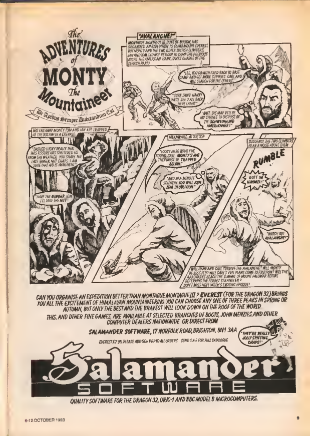
Having visited a large number of computer shops in my time, I have been able to carry out extensive medical research into associated diseases Most owners or assistants (many under 16) have the affliction known as 'BBC Syndrome'

This horrifying brain disease affects these unfortunates in such a way that customers become invisible to their eyes! The assistants' natural instinct to help a customer is totally destroyed by amasing, mind zapping games for the ssh BBC Micro Unless you are a fellow sufferer, you appear to them as a piece of fluff or just another office plant (strangely enough another similar disease involves a fad neh, infatuation for lush, green, tropical plants)

So come on 'BBC Syndrome' sufferers, give us 'non beeb' users a break and get some therapy

Stephen Thornley
87 Station Road
Marple
Stockport SK6 6NY

PS I m a frustrated Vic owner and still looking for help!


The ADVENTURES of MONTY The Mountaineer
De Apibus Semper Dubitandum Est
"AVALANCHE!"
MONTAGUE MONTAGUE III DUKE OF BOLTON, HAS ORGANISED AN EXPEDITION TO CLIMB MOUNT EVEREST BUT MONTY AND THE TWO OTHER BRITISH CLIMBERS, IAN AND TOM DID NOT RETURN TO CAMP THE PREVIOUS NIGHT. THE AMERICAN HANK, TAKES CHARGE OF THE SEARCH PARTY
"LEE, YOU GO WITH FRED BACK TO BASE CAMP AND GET MORE SUPPLIES. CARL AND I WILL SEARCH FOR THE OTHERS."
"SURE THING HANK! WE'LL SEE Y'ALL BACK HERE LATER"
"GUT. DIS MAY VELL BE MY CHANCE TO DISPOSE OF ZIE SCHWEINHUND AMERIKANER!"
NOT FAR AWAY MONTY TOM AND IAN ARE TRAPPED AT THE BOTTOM OF A CREVASSE
"DASHED LUCKY REALLY THAT THIS FISSURE HAS SHELTERED US FROM THE WEATHER. YOU SHARE THE LAST GINGER NUT CHAPS. I AM SURE THAT AID IS IMMINENT!"
"HAVE THE GINGER TOM I'LL TAKE THE NUT"
MEANWHILE AT THE TOP
"LOOKY HERE WHAT I'VE FOUND CARL. MONTY'S HAT. THEY MUST BE TRAPPED BELOW"
"AND IN A MINUTE SCHWEIN YOU WILL JOIN ZEM IN OBLIVION"
SUDDENLY, THE TWO CLIMBERS HEAR A NOISE ABOVE THEM
RUMBLE
"GOTT IM HIMMEL!"
"WATCH OUT AVALANCHE!"
WILL HANK AND CARL SURVIVE THE AVALANCHE? WILL MONTY BE RESCUED? WILL CARL'S EVIL PLANS COME TO FRUITION? WILL THE AARDVARKS REACH THE SUMMIT OF MOUNT PALOMAR BEFORE RETERKINS THE FERRET STRANGLER?
DON'T MISS NEXT WEEK'S EXCITING EPISODE!
CAN YOU ORGANISE AN EXPEDITION BETTER THAN MONTAGUE MONTAGUE III ? EVEREST (FOR THE DRAGON 32) BRINGS YOU ALL THE EXCITEMENT OF HIMALAYAN MOUNTAINEERING. YOU CAN CHOOSE ANY ONE OF THREE PEAKS IN SPRING OR AUTUMN, BUT ONLY THE BEST AND THE BRAVEST WILL LOOK DOWN ON THE ROOF OF THE WORLD
THIS, AND OTHER FINE GAMES, ARE AVAILABLE AT SELECTED BRANCHES OF BOOTS, JOHN MENZIES, AND OTHER COMPUTER DEALERS NATIONWIDE OR DIRECT FROM
SALAMANDER SOFTWARE, 17 NORFOLK ROAD, BRIGHTON, BN1 3AA
"THEY'RE REALLY JOLLY SPIFFING CHAPS!"
EVEREST £7.95. PLEASE ADD 50p P&P TO ALL ORDERS. SEND S.A.E FOR FULL CATALOGUE
Salamander
SOFTWARE
QUALITY SOFTWARE FOR THE DRAGON 32, ORIC-1 AND BBC MODEL B MICROCOMPUTERS.

Asteroid Dodge

A new game for BBC B by Phillip Wells

This is a game for the BBC micro model B, and involves piloting a small shuttlecraft through a maze of asteroids and alien saucers. It is possible to ram the saucers and gain 10 extra points but beware: if you hit the alien on the side, you will instantly explode, for the sides of the aliens are protected by shields. The asteroids naturally are indestructible.

At the end of a game, your score is printed. It is worked out by the time you lasted in seconds, plus any bonuses for ramming aliens. Full instructions are included in the program.

Notes

170-310	Sets up variables
320-420	Main program
430-490	Checks for character number at location X% Y% on the screen
500-590	Checks if you have collided with an asteroid or an alien
600-630	Deals with left and right movement of your shuttle
640-820	Deals with crash, prints score and High-score
830-1260	Prints the instructions

■



```
>LIST
 10REM ******************
 20REM *                *
 30REM * Asteroid Dodge *
 40REM *                *
 50REM *       By       *
 60REM *                *
 70REM * Phillip Wells  *
 80REM *                *
 90REM *     Aged 11    *
100REM *                *
110REM *    11/8/1983   *
120REM *                *
130REM ******************
140:
150MODE7
160PROCinstruct
170MODE2
180QB%=0
190H%=0
200ENVELOPE 1,1,3,-5,-4,-5,120,-120,9,120,-126,12,
   126,126
210VDU 23,224,&18,&24,&43,&20,&10,&20,&40,&80
220VDU 23,225,&00,&00,&1C,&A2,&41,&02,&04,&04
230VDU 23,226,&60,&80,&00,&40,&24,&1A,&01,&00
240VDU 23,227,&02,&01,&02,&04,&08,&00,&10,&E8
250 VDU 23,228,&22,&5D,&91,&81,&82,&74,&08,&00
260VDU23,231,&00,&00,&10,&38,&28,&FE,&44,&38
270VDU23;8202;0;0;0;
280 TIME=0
290VDU23,230,&18,&18,&24,&3C,&3C,&7E,&FF,&66
300X%=15:Y%=30
310QB%=0
320A%=RND(4)
330IF A%=1 THEN COLOUR 1:F%=RND(18):PRINTTAB(F%,2);
   CHR$224;CHR$225 PRINTTAB(F%,3);CHR$226CHR$227
340IF A%=2 THEN COLOUR4 F%=RND(19):PRINTTAB(F%,1);
   CHR$228
350IF A%=3 AND RND(2)=1 THEN COLOUR2:PRINTTAB(RND
   (19),1);CHR$231
360PRINTTAB(X%,Y%)" "
370PRINTTAB(0,0);:VDU11
380COLOUR3
390PROCKEY
400PRINTTAB(X%,Y%);CHR$230
410PROCCHECK
420GOTO320
430DEFFNread(X%,Y%)
440LOCAL A%,C%
450A%=135
460VDU31,(X%+19) MOD 19,Y%
470C%=((USR(&FFF4) AND &FFFF) DIV &100)
480IF C%<128 THEN =C%
490=(C% MOD 32)+224
500DEFPROCCHECK
510C%=FNread(X%,Y%-1):IF C%=32 THEN ENDPROC
520 IF C%=231 THEN SOUND 1,1,50,10 SOUND2,1,100,10
   :SOUND3,1,150,10:QB%=QB%+10 ENDPROC
530IF FNread(X%,Y%-1)=228 THEN PROCCRASH
540IF FNread(X%,Y%-1)=227 THEN PROCCRASH
550PROCKEY
560IF FNread(X%,Y%-1)=226 THEN PROCCRASH
570IF FNread(X%,Y%-1)=225 THEN PROCCRASH
580IF FNread(X%,Y%-1)=224 THEN PROCCRASH
590ENDPROC
600DEFPROCKEY
610IF INKEY(-98) AND X%>1 THEN PRINTTAB(X%,Y%)"
   :X%=X%-1:C%=FNread(X%,Y%):IF C%<>32 THEN PROCCRASH
620IF INKEY(-87) AND X%<18 THEN PRINTTAB(X%,Y%)"
   ":X%=X%+1 C%=FNread(X%,Y%):IF C%<>32 THEN PROCCRASH
630ENDPROC
640DEFPROCCRASH
650FORK%=-15TO0:SOUND0,K%,6,1:NEXT
660A%=X%*64 B%=1020-Y%*32
670FORI=1 TO 30:GCOL0,RND(7):PLOT69,A%+RND(64),
   B%-RND(32):NEXT
680CLS
690S%=QB%+TIME DIV 100
700COLOUR132:COLOUR3
710PRINTTAB(0,0);STRING$(19," ")
720PRINTTAB(0,2);STRING$(19," ")
730PRINTTAB(0,1)"  ASTEROID DODGE   "
740COLOUR128
750 IF S%>H% THEN H%=S%
760COLOUR3 PRINTTAB(5,15)"Score: ";S%
770 PRINTTAB(5,17)"High : ";H%
780COLOUR2 PRINTTAB(1,27)"Press ""S"" to start"
790G$=GET$
800IF G$="S" THEN 810 ELSE 790
810CLS GOTO280
820ENDPROC
830DEFPROCinstruct
840PRINTTAB(0,0);CHR$129CHR$157CHR$131CHR$141"
   A s t e r o i d  D o d g e"
850PRINTTAB(0,1);CHR$129CHR$157CHR$131CHR$141"
   A s t e r o i d  D o d g e"
860PRINT:PRINT
870D$=CHR$131
880PRINTD$"One day, as you were returning from a"
890PRINTD$"trading mission in your spaceship,"
900PRINTD$"you acidentally got caught in the"
910PRINTD$"gravitational pull of nearby Saturn."
920PRINT PRINT
930D$=CHR$130
940PRINTD$"You knew that there was no way that"
950PRINTD$"you could stop the crash, and so you"
960PRINTD$"instantly got out in your escape"
970PRINTD$"shuttle. But you had forgotten about"
980PRINTD$"the rings of Saturn, deadly walls of"
990PRINTD$"asteroids. To get to freedom, you had"
1000PRINTD$"to go through the rings."
1010 PRINTTAB(0,22);CHR$129CHR$157CHR$131"
    Please press any key to continue."
1020D$=GET$
1030CLS
1040PRINTTAB(0,0);CHR$129CHR$157CHR$131CHR$141"
     A s t e r o i d  D o d g e"
1050PRINTTAB(0,1);CHR$129CHR$157CHR$131CHR$141"
    A s t e r o i d  D o d g e
1060PRINT
1070D$=CHR$130
1080PRINTD$"You had also forgotten about the enemy"
1090PRINTD$"saucers. These inhabit the asteroid"
1100PRINTD$"belt, but can be rammed, for 10Pts."
1110PRINTD$"The saucers are only vunerable from"
1120PRINTD$"the front though. Collisions on the"
1130PRINTD$"side will result in instant destuction"
1140PRINTD$"for your ship."
1150PRINT
1160D$=CHR$131
1170PRINTD$"Your score is determind by how long"
1180PRINTD$"you survive plus any bonuses for"
1190PRINTD$"ramming saucers. Controls are:"
1200PRINT
1210D$=CHR$129
1220PRINTD$"Z  [ [ [  Left        Right  ] ] ]  X"
1230PRINT
1240D$=CHR$130
1250PRINTD$"   Good Luck !!! You'll need it !!!"
1260 PRINTTAB(0,22);CHR$129CHR$157CHR$131"
    Please press any key to continue."
1270F$=GET$
1280ENDPROC
```

A run for your money

***Brian Cadge** goes walkabout with Cuthbart in this review of Dragon software*

Having survived its financial difficulties (*PCW* 8-14 September), Dragon Data can now look forward to a brighter future with the launch of several new machines expected soon The Dragon 32 has not been forgotten though the long awaited disc drives are finally available and the 64K upgrade is expected shortly Indeed, the software range for this machine is growing every week both in size and quality, as this latest look at Dragon goodies shows

Dragon Data has a growing range of games software for its machine, *Berserk* being one of the recent cartridges This is a copy of the somewhat dated arcade game of the same name You have crashed on a hostile planet inhabited by robots and *Evil Orville* (not the green duck but a grinning ball) Wandering through rooms killing off the robots with your laser gun, avoiding the electrified walls and the robots fire and keeping well away from the immortal *Orville* are all part of your day here

You are greeted with a very attractive and colourful title page on turning on But the game itself to my horror uses only *PMODE 4* graphics — black and white! The graphics were obviously designed for colour resolutions by the arrangement of the dots The game in play is rather slow for machine code — the robots plod along occasionally taking a pot shot at you and it takes the player 10 seconds just to get from one side of the room to the other

The graphics are quite well animated, though colour would surely have been worth the slight sacrifice in resolution There is no on-screen scoring either The method of firing is only really suited to Atari type joysticks not the ones the Dragon uses — it s also annoying that only one bullet can be on the screen at once Good use is made of sound effects but generally this game doesn t really come up to the standard of cartridge material At a little under £20 this piece of software is rather over priced

The Programmers Guild is a fairly new name as far as Dragon software is concerned Its first offering is *Ninja Warrior* Up to six players can go one by one with either joystick or keyboard control Starting at white belt level your *Ninja Warrior* (who is displayed as a man in a Kung Fu outfit) runs along kicking rocks out of his way Get past this level and you go on to the yellow belt here there are rocks, fire heaps and holes to kick and jump over In subsequent levels fireballs are thrown at you and ultimately you must deal with the Ninja masters It is possible to go through to the black belt level — level 16 — but I ve never managed it even with the bonus men at every 10 000 points

The graphics are only the equivalent of Basic s mode one, but good use is made of them The scrolling background and movement of the man is rather jerky but being 100 percent machine code it is reasonably fast The sound effects are also very good especially the sound of a creaking door when the title page appears The game uses only one joystick — the left one I found this maddening, as all other single joystick games use the right socket — remembering to keep swapping from game to game was a real pain

The advertisements say that "*Ninja Warrior* is a totally awesome experience in arcade action", very original it is, but it is going over the top to describe it in these terms — the real arcade machines passed this stage years ago

Three games from Microdeal now *Storm* was one of the first to be released by this company and it shows It is a poor adaptation of that ageing arcade game which I think was called *Surround* You control a straight line that moves round the edge of a tunnel, firing back at straight lines coming in the other direction Not very exciting originally and this version for the Dragon is even worse with its total lack of sound and low resolution graphics Microdeal have set themselves a very high standard to maintain with their games and this one falls well short of what is expected from them

The latest release is *Cuthbert goes Walkabout*. *Cuthbert* is a cute little guy whom you control with the joystick He must turn on the lunar landing light for a state visit, before the invading Moronians get him The lunar landing lights are actually squares on a 7x5 grid which light up when *Cuthbert* has walked round all four edges

If one of the Moronians touches him, *Cuthbert* and the invader both impressively explode and you lose a life If you fill in the whole screen a bonus *Cuthbert* dances on to the screen Successive screens get harder as more Moronians appear the colours also change, although you can return to the standard colours at any time (useful for black and white tv s) You can also pause the game and return to it later

Either joystick or keyboard can be selected to move *Cuthbert* in all four directions and make him jump *Donkey King* style over the baddies If you get a good score you may enter your name in the Cuthbert hall of fame, via the joystick in the traditional arcade way The graphics used are not the highest res available, but clever use is made of them and the game is very fast

This is certainly one of the best games to come from Microdeal not quite in the *Donkey King* category, but approaching it At only £8 you can t really go wrong anyway

Finally from Microdeal is *Backgammon*, the old board game The first thing I noticed was that the game takes ages to *Load* The reason for this turned out to be the method of autorunning the program *Loading* starts down in the system variables, then has to go through 6K of graphics pages before it starts to *Load* the actual Basic program This may be a good way to prevent software piracy but it s not very clever as far as *Loading* times are concerned

On to the game itself The option to use a light pen is included and this works very well with most on the market, including Microdeal s own Alternatively, normal keyboard input can be selected

From zero to two players can take part and the level of computer play can also be set from one to 10 The graphics are not bad — a backgammon board, being made up of triangles is not the easiest thing to display on a computer and this attempt is fair When the computer is playing above level four it takes an extremely long time over its own move even with the option of the double speed *Poke* the program is still very slow

Dragrunner is the latest game from Cable Software the people that brought you *Troff* The program is a mixture of machine code and Basic The former is used for scrolling and all the sounds Some quite clear speech synthesis is also included — not on the tape as in *Toff* but real computer generated speech The general sound effects are also very good indeed playing a major part in the game

The object is to get *Sidney* who is barely recognisable as a figure of a man

across the factory floor To do this he must negotiate moving conveyor belts loaded with radioactive components Occasionally, you shoot guards which appear — if you take too long over the whole thing the laser guns shoot you

You could describe the game as a space age *Frogger* The graphics although well defined are jerky and rather slow The program s great redeeming feature is its speech and excellent packaging But, for sheer playability, the game scores rather badly — this is not a game where you find yourself saying Just one more go And at £8 75, it is rather expensive for a game written almost entirely in Basic

Salamander Software is another manufacturer known for its excellent packaging *Star Jammer* the latest game, comes in a full colour mini video case with instruction sheet Those are the good points Unfortunately, the whole game is in Basic

If you can imagine a version of Atari's *Star Raiders* without all the trimmings written in Basic with the background in white instead of black, then you'll get a good idea of this game Using the joystick to control your sights enemy ships come towards you which you try and shoot if you re lucky

Salamander's software is generally very good but this game, which most users could write themselves, should have been scrapped long before getting on to the market

Pimania is now available for the Dragon Yes the Piman is here! *Pimania* is, for anyone who s been living under a rock, the infamous adventure game with the real treasure prize of a golden sundial Apart from the Piman who keeps popping up to befriend you, or if you annoy him, to turn against you this is a fairly standard adventure game That is not to say that it is not good — nice use of graphics and sound and the occasional advertisement for *Pimania* tee shirts make the game amusing at least The flip side of the cassette contains a ghastly recording by Clair Sinclive (the joke isn't so funny on a game for the Dragon is it?) which is worth listening to if you can stand it, as it contains some useful clues

As with all adventure reviews you can t really describe the game itself as this would spoil it, but *Pimania* does have many locations to explore some nice graphics and a very wide vocabulary, even recognising obscenities There is a *Save* game feature, so that you can leave a game in progress and come back to it later

Hewson Consultants produce a flight simulator written in Basic, called *Dragonfly* for £8 The instructions are in very small print on the inlay card and are long and complicated If you want a stunning 3D representation of flight, forget it But if you want a true to life simulation with full instrumentation and a low resolution artificial horizon then this is for you

The program is th real time, and the display constantly shows all the instruments and a simple view from the cockpit. There are two runways to choose from — Norwich and Hethal You control the plane via the joysticks and/or the keyboard If a crash occurs the crash code appears with a table showing each code and an explanation

The program takes some getting used to, it took me a few hours to get up and flying — let alone land the damn thing again As I said this is not designed to be a game but a simulation — you will need a lot of patience and a real interest in flying to get the most out of it

Finally to another machine code arcade game — *Dragon Hawk* from Pentagon now marketed by Microdeal

The program autoruns on *Loading* and offers full instructions The graphics are full colour in the highest resolution and are very good Controlling your laser base you must shoot the eggs on the screen which scroll past whilst avoiding the swooping birds which fell down dead and lie in wait twitching below you All the time a giant bird is making its way down to kidnap your little man and fly off with him

You must shoot down the hawk avoiding its droppings and catch the man — that s not as easy as it sounds either Both the birds and the man are excellently animated and the sound effects are also very good You get three lives per game and, if you wipe out the whole screen you go on to an even harder and faster one

I have commented before on the way some software houses try to produce arcade quality games using Basic It is nice to see in this review so many machine code quality games available It is also good to see some of the smaller companies going into Dragon software and giving the established firms a run for their money ■

Supplier	Game	Price	Value (0-10)
Dragon Data Ltd Kenfig Industrial Estate Port Talbot SA13 2PE	*Berserk* (cartridge)	£19 95	5
Programmers Guild Ahed House Sandbeds Trading Estate Ossett West Yorkshire WF5 9ND	*Ninja Warrior*	£8 95	7
Microdeal 41 Truro Road St Austell Cornwall PL25 5JE	*Storm* *Cuthbert* *Backgammon* *Dragon Hawk*	£8 00 £8 00 £6 00 £8 00	3 6 7 8
PSL Marketing 52 Limbury Road Luton Beds LU3 2PL	*Dragrunner*	£8 75	6
Salamander Software 27 Ditchling Rise Brighton East Sussex BN1 4QL	*Star Jammer*	£7 95	2
Automata Ltd 27 Highland Road Portsmouth Hants PO4 9DA	*Pimania*	£10 00	7
Hewson Consultants 60a St Mary s Street Wallingford Oxfordshire OX10 0EL	*Dragonfly*	£7 95	7


VALH
48K SPECTRUM

Character limits

***Bryan Skinner** explains how to restrict user input to a limited number of characters*

In a previous article (*PCW* 14-20 July 1983) I described a rather crude method for limiting user input to a given number of characters. This article describes a much-improved version of the routine, though it is rather more specific to the Dragon 32 micro. The improvements are (a) the use of 'backspace', (b) the speed of keyboard response, and (c) the indication on the screen of the input field.

In many commercial programs the user is prompted to enter data into a prescribed field, eg

NAME <   >

The carets or angle brackets indicate the size of the entry that may be made. The cursor may be moved between the markers and pressing 'enter' or 'return' terminates entry of data into the field, rather like the normal use of *Input*. The advantages of limiting data entry in this way are many — the user cannot upset the screen display and elementary validation of entries is performed automatically.

The flowchart for a routine to achieve this improvement to *Input* is shown in Fig 1. The essential steps are: (a) Collect a character from the keyboard. (b) If the character is a backspace (left arrow, Ascii code 8) and the length of the string of characters collected so far is greater than 0, then print the backspace (ie "rubout" the previous character) and strip the string of collected characters of the last item. (c) Add the character to the string of characters being collected. (d) If the length of this string exceeds the maximum length allowed, strip the string to the length required.

The other entries in the flowchart serve to perform other necessary tests and checks, such as checking that a key has been pressed, updating the length of the string of collected characters, etc.

The program *per se* has some added niceties: line 1000 defines *Bs$* as a backspace *(Chr$(8))*, *Rt$* as *Enter* or *Return* *(Chr$(13))* and nullifies *Wd$* and *A$* (*Wd$* is used to collect characters). Line 1010 is specifically for the Dragon and requires that the dimension *L* has been set up, as described in a previous article, to hold the *Print @* positions for text screen lines 1-16. It also requires *Mx*, the maximum length of the string to be entered. *Ad* is defined as the screen address to be used as the offset used to calculate where to place (by *Poke*) the brackets (to indicate the size of the entry field). *Pos (0)* returns the current column of the cursor on its *Print* line. *Li* is the current print line.

Line 1020 *Pokes* the brackets (*Ascii* codes 126 & 124) to the relevant positions of the screen. I have in fact reversed the commonly used types, but you could use whatever characters strike you as most appropriate. Line 1090 ensures that the length of the collected string of characters never exceeds the limit set by *Mx*.

The routine "returns" *Wd$* as the user's input, just like *Input Wd$* or more accurately *Line Input Wd$*, since it will accept commas. Calling the routine requires that we set two variables — *Li* and *Mx*. In the form given, it also requires two spaces after the prompt, but you could alter this and the corresponding calculations in line 1020. For example, we might at some stage in a program require the user to enter a three character code. To use the routine, we might code lines such as

```
500 PRINT @ L(5) "ENTER A 3 CHARACTER CODE"
       REM 2 SPACES AT END
510 MX = 3:LI = 5:GOSUB 1000
520 PRINT @ L(5)    IF LEN (WD$)<> 3 THEN 500
```

If we wanted to collect a three-digit number, we would have to use a routine to validate any given string to establish whether or not it contained only numeric characters. Of course, since we are dealing now with numeric values, we must also allow negatives. The *Ascii* value of the negative sign is 45.

Such a routine is given in Figure 3 and returns two values — *Ef* is set to 1 if the entry in *Wd$* is not numeric and *V* is set to the value of a valid numeric entry, or 0 if the string is non-numeric.

Users with machines other than the Dragon will have to alter the screen handling lines of 1010 and 1020, or they may elect to drop them altogether, though psychologically speaking users do like to see exactly what limits there are when entering data. I believe that *Chr$(8)* is generally used for the backspace code, but if you are not sure of your micro's *Crt* codes, you can check this by

```
10 PRINT "A"
20 FOR D = 1 to 500 NEXT
30 PRINT CHR$(8)
```

If the letter *A* is printed, then erased, you're OK, otherwise you'll have to experiment.

Happy Hacking, Terminal Junkies ■

The routine in Figure 3 can be called after calling the Input routine and will return with Ef set to 0 if the string is numeric (V will be set to the value of entry). If Ef is equal to 1, then the string is not a valid decimal integer.

You may wish to alter the routine to accept decimal points, but this is somewhat more complex.

Figure 1

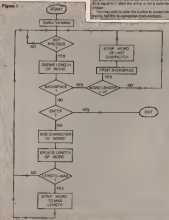


Fig 2 The routine

```
1000 WD$ = "": A$ = WD$  RT$ = CHR$(13). BS$ = CHR$(8)
1010 AD = 1024 + POS(0) + L(LL)
1020 POKE AD-1,126.POKE AD + MX,124
1030 A$ = INKEY$ : IF A$ = "" THEN 1030
1040 LD = LEN (WD$)
1050 IF A$ = BS$ AND LD>0 THEN WD$ = LEFT$( WD$,LD-1)
     PRINT BS$,.GOTO 1030
1060 IF A$ = BS$ AND LD<1  THEN 1030
1070 IF A$ = RT$ THEN RETURN
1080 WD$ = WD$ + A$ LD = LD + 1
1090 IF LD > MX THEN WD$ = LEFT$ (WD$,MX):GOTO 1030
1100 PRINT A$;
1100 GOTO 1030
```

FIG. 3 Numeric Validation Routine.

```
1999 EF = 0
2000 FOR T = 1 TO LEN(WD$)
2010 T$ = MID$(WD$,T,1)
2020 A = ASC(T$)
2030 IF (A<48 OR A>57) AND
     ( A<>45) THEN EF = 1
2040 IF A = 45 THEN S = 1 : P = T
2050 NEXT
2060 V = ABS (VAL(WD$))
2070 IF S = 1 AND P = 1 THEN V = -V
2080 RETURN
```

Along the airwaves

Ray Berry presents a selection of routines for radio users

This program, which contains five different routines for radio users is designed to be as simple and machine portable as possible. It was written on a Sinclair Spectrum and will run in 16K. It is menu driven and, on selection of the subject required the program branches to the routine concerned.

Routine one gives the information to design an attenuator used to reduce strong radio or tv signals. A small drawing is made using simple graphics and the user is asked to input the amount the signal should be reduced by — 3db, for example, halves the signal strength. Next, the user is asked for the impedance of the line which is 75 Ohms for most tv aerials, 50 for most VHF radio applications and 300 for shortwave work. Any other impedance is also catered for.

The second routine will calculate the number of turns that are required when making a coil or inductor. The computer asks for the diameter of the coil, the number of turns per inch and the required inductance. This routine is invaluable for those who build their own equipment.

The third routine is for the computer design of tuned circuits, the heart of any radio. It is the tuned circuit that separates the station required and rejects the others in the chaos of the airwaves. The user is asked to input the known information and the computer works out the unknowns.

Routine four is a menu driven program in its own right. It calculates all the aspects of Ohm's law of physics. All the computer asks is that all elements or inputs are in the same kind of unit. This routine alone should be useful to anyone interested in or studying physics and shows how a computer can best be used.

The last routine gives the length of elements in what is known as a cubical quad antenna. Often used as a tv aerial, the quad is one of the most effective gain antennas available and is easily made at home with loops of wire. The user inputs the frequency at which the aerial is to be used and the computer does the rest — except actually build it, of course.

Line(s)

10 Sets attributes
12 Poke statement to set the keyboard bleep
15-18 Sets up title page and uses PAUSE command to wait for input of any key. CLS is screen clear
20-30 Sets up menu page and accepts input of option required
35-50 Error trapping routine and computed goto command. Those micros having ON ... GOTO can use that instead ■

This article is the precursor to a regular weekly column about microcomputers and radio. Starting next week Ray Berry will present a round-up of the radio world in *Microradio*

```
  10 BORDER 7: PAPER 7: INK 0
  11 REM ARRABLE RADIO MISCELLAN
NYBY RAY BERRY GU8JJN
  12 POKE 23609,80
  15 PRINT AT 10,8; RADIO ROUTIN
ES ;AT 18,5; BY RAY BERRY GU8JJN

  16 PRINT AT 21,3; Press any ke
y to continue...
  17 PAUSE 0
  18 CLS
  20 PRINT      RADIO ROUTINES BY
 GU8JJN
  21 PRINT AT 3,13; MENU
  22 PRINT : PRINT : PRINT  PRI
NT  1.      T  Network Attenua
tor
  23 PRINT : PRINT '2.    Coil W
inding Calculations'
  24 PRINT : PRINT  3.
 L & C Calculations'
  25 PRINT : PRINT '4.   Series
& Parallel Elements
  26 PRINT : PRINT  5.    Quad
Aerial Construction
  30 INPUT  Enter Option Require
d ',q
  35 IF q<1 OR q>5 THEN GO TO 30
  40 LET q=q*100
  50 GO TO q
 100 CLS : PRINT AT 10,0; ROUTI
NE TO CALCULATE RESISTORS    IN
 T  NETWORK ATTENUATOR
 101 PRINT AT 20,3;'PRESS ANY KE
Y TO CONTINUE'
 102 PAUSE 0
 105 CLS : INPUT 'Enter source a
nd terminating    resistance in
ohms. ',r0
 110 INPUT 'Attenuation required
 in DB s. ',y: LET x=10↑(y/20)
 120 LET ra=r0*((x-1)/(x+1)): LE
T ra=INT ((ra*10+.5)/10)
 130 PRINT : PRINT "RA= ",ra, " Oh
ms. ' Two RA's in series.
 140 LET rb=2*r0*(x/(x↑2-1)): LE
T rb=INT ((rb*10+.5)/10)
 150 PRINT : PRINT "RB= ",rb, " Oh
ms. ' RB connects junction of RA
s to ground.
 160 PRINT AT 10,8;'
 ;AT 11.8;
 170 PRINT AT 12,15; ,AT 13,15
; ,AT 14,14;  ,AT 15,14;
AT 16,14;'  ,AT 17,14;  ,AT
18,15; ',AT 19,15; ',AT 20,15;

 180 PRINT AT 9,7;ra,AT 9,21;ra,
AT 15,17;rb
 190 GO TO 1000
 200 CLS : PRINT AT 10,1; ROUTIN
E TO CALCULATE TURNS ON  COILS.
 201 PRINT AT 20,3; PRESS ANY KE
Y TO CONTINUE
 202 PAUSE 0
 203 CLS : INPUT  Diameter of co
il in inches? ',d: LET r=d/2
 205 PRINT AT 1,2; Coil diameter
 = ',d
 210 INPUT  Inductance in microh
enries? ',l
 215 PRINT AT 3,2;'Required indu
ctance = ',l, mh'
 220 INPUT  Number of turns per
inch?  ,n
 225 PRINT AT 5,2;'Required tpi
= ',n
 230 LET x=5/(n*r↑2): LET b=(SQR
 (9/(r*l*x↑2)+1))
 240 LET t=x*l*(b+1): LET t=INT
((10*t+.5)/10)
 250 PRINT AT 10,2; Total turns
required = ',t
 260 LET cl=(t/n)+1: LET cl=INT
((10*cl+.5)/10): PRINT AT 13,2;
Length of coil = ',cl,' inches.
 270 IF d>(3*cl) THEN PRINT AT 1
7,1; Coil diameter is greater th
an  three times it's length.'
Try changing parameters."
 280 GO TO 1000
 300 CLS : PRINT AT 10,1; L & C
CALCULATIONS
 301 PRINT AT 20,3; PRESS ANY KE
Y TO CONTINUE
 302 PAUSE 0
 305 CLS : PRINT  WHICH CALCULAT
ION?": PRINT
 306 PRINT      1. Tuned Circuit
: PRINT     2. Inductive reacta
nce.: PRINT     3. Capacitive r
eactance.: PRINT : PRINT    4.
Return to main menu : INPUT a
 308 IF a=4 THEN CLS : GO TO 10
 310 CLS : PRINT 'Input values a
s prompted.' Input 0 for unknow
ns.
 312 PRINT : PRINT
 315 INPUT  Frequency in Hertz?
',f
 318 IF a=1 THEN GO TO 350
 320 INPUT  Reactance in ohms? ,
x
 321 IF a=2 THEN GO TO 325
 322 IF a=3 THEN GO TO 350
 323 GO TO 305
 325 INPUT  Inductance in Henrys
',l
 330 IF f=0 THEN LET f=x/(2*PI*l
)
 332 IF l=0 THEN LET l=x/(2*PI*f
)
 334 IF x=0 THEN LET x=2*PI*f*l
 335 PRINT 'Inductance in Henrys
is  ',l
 340 PRINT  Reactance in ohms is
 ',x
 345 PRINT  Frequency in Hertz i
s ',f
 347 PRINT AT 21,3;'PRESS ANY KE
Y TO CONTINUE
 348 PAUSE 0
 349 GO TO 305
 350 INPUT  Capacitance in micro
farads? ',c
 352 LET c=c/1000000
 353 IF a=1 THEN GO TO 370
 355 IF x=0 THEN LET x=1/(2*PI*f
*c)
 357 IF c=0 THEN LET c=1/(2*PI*f
*x)
 358 IF f=0 THEN LET f=1/(2*PI*x
*c)
 359 LET c=c*1000000
 360 PRINT  Capacitance in micro
farads is  ',c
 365 GO TO 340
 370 INPUT  Inductance in Henrys
? ',l
 375 IF f=0 THEN LET f=1/(2*PI*S
QR (l*c))
```

```
375 IF l=0 THEN LET l=1/(4*PI↑2*f↑2*c)
377 IF c=0 THEN LET c=1/(4*PI↑2*f↑2*l)
378 LET c=c*1000000
380 PRINT "Capacitance in micro farads is ";c
388 LET x=0: GO TO 334
400 CLS : PRINT AT 10,0;"RESISTORS, INDUCTORS OR       CAPACITORS IN SERIES OR PARALLEL"
401 PRINT AT 20,3;"PRESS ANY KEY TO CONTINUE"
402 PAUSE 0
405 CLS : PRINT "MAKE CERTAIN THAT ALL ELEMENTS  OF EACH CALCULATION ARE IN THE  SAME UNITS,eg Kilohms,picofaradsetc.."
408 PRINT
410 PRINT : PRINT "WHICH CALCULATION?"
415 PRINT : PRINT "   1. Resistors or inductors in series or capacitors in parallel"
416 PRINT : PRINT "   2. Resistors or inductors in parallel or capacitors in series"
417 PRINT : PRINT "   3. Return to main menu"
420 INPUT "Input option ";o
423 IF o<1 OR o>3 THEN GO TO 465
424 IF o=3 THEN CLS : GO TO 10
425 CLS : INPUT "How many elements are there? ";n
426 IF n<0 THEN GO TO 425
427 LET n=INT n
428 LET s=0
430 FOR i=1 TO n
432 INPUT "Value ";v
434 PRINT "Element No.",i," Value ";v
440 IF o=1 THEN LET s=s+v
445 IF o=2 THEN LET s=s+1/v
455 NEXT i
460 IF o=2 THEN LET s=1/s
465 PRINT : PRINT "Total of all ";n;" elements ";"= ";s
470 PRINT AT 21,3;"PRESS ANY KEY TO CONTINUE"
475 PAUSE 0
480 GO TO 405
500 CLS : PRINT AT 10,1;"TWO ELEMENT QUAD ANTENNA DESIGN"
501 PRINT AT 20,3;"PRESS ANY KEY TO CONTINUE"
502 PAUSE 0
503 CLS : INPUT "INPUT CENTRE FREQENCY IN MHZ ";f
505 PRINT "   QUAD ANTENNA FOR ";f;" MHZ"
508 PRINT
510 LET e=.985*f: LET g=1.033*f: LET d=1005/f: LET r=1030/f: LET b=118/f
515 LET x=(2*f(r*r/64)): GO SUB 550
516 LET s=y: LET x=(s*s+(b*b/4)): GO SUB 550
517 LET p=y: LET x=((r*r/64)+75*75/(f*f*4)): GO SUB 550
518 LET t=y: LET x=((r*r/64)+128*128/(f*f*8)): GO SUB 550
519 GO SUB 550
520 LET u=y: LET w=468/f
525 PRINT : PRINT "This 2 element quad should have ' an SWR of 1.5 1 or less over the ''frequency range from ";e
526 PRINT " to ";g;" Mhz with 50 to 75 ohms ' feed line."
527 PRINT "A boom length of ";b;" feet is ' optimum, but can be varied' between ";75/f;" and ";128/f;" feet with little effect."
528 PRINT "Total length of wire in driven' element is ";d;" ft which is ";d/4;" ft on each side."
530 PRINT "Total length of wire in 'reflector is ";r;" ft."''"That is";r/4;" ft each side."'"Min length of spreader measured ' from boom is ";s;" ft.  If quad is boomless then a ''spreader of ";p;" ft is needed"''"Turning radius depends on boom.' 'Best height is a half wave ' above ground ";w;" ft' or more."
535 PRINT "Front to back ratio exceeds  10db from ' ";.97*f;" Mhz to ' about ";1.03*f;" Mhz. ' At ";f;" Mhz it is 25db."
540 GO TO 1000
550 IF x>=0 THEN GO TO 553
551 PRINT "No square root for negative." : GO TO 553
553 LET y=x/2: LET z=0
554 LET w=(x/y-y)/2
555 IF w=0 THEN RETURN
556 IF w=z THEN RETURN
557 LET y=y+w: LET z=w
558 GO TO 554
999 REM © Ray Berry QUBJUN 1983
1000 PRINT AT 21,3;"PRESS ANY KEY TO CONTINUE"
1005 PAUSE 0: CLS : RUN 10
```

In a word . . .

Peter Whittaker *presents a user friendly word processing program*

In my reading of several of the popular computer magazines I have come across a couple of word processing programs for the Dragon. However they all seem to have one failing, they have sacrificed user friendliness in favour of a large text storage capacity. I believe that the Dragon has enough memory to accommodate a program that is both friendly, and has enough text memory to meet most people's requirements.

Before *Loading* the following program, enter *Poke25 6 New* to achieve a *Pclear0*. When the program is run, a menu is presented after the title page. This can be recalled at any time by pressing the shift and up arrow keys.

Functions 3 and 4 are for *Saving* and *Reloading* half finished pieces to and from the cassette recorder. Functions 5 and 6 enter the *Edit* mode.

The cursor is controlled by the four arrow keys. However, rather than move the cursor over a small page of 512 letters a machine code routine scrolls a window of text under the cursor. When using the Editor the desired position is indicated by pressing the enter key. The cursor remembers its position in the text memory for subsequent calls to the Editor.

Function 7 allows the use of characters not directly available from the keyboard. This is useful for sending control codes to the printer. Functions 9 and 10 control the backspace. As the cursor is moved back it leaves a trail behind it. Letters can be altered by entering them as normal, and when the shift and down arrow keys are pressed the cursor will return to the end of the text displaying the alterations.

Capital letters are obtained by holding down the shift key — I have reversed the usual Dragon practice of highlighting the lowercase letters, as I thought it more logical to emphasise the capitals.

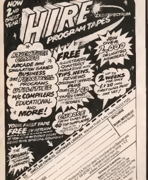
Text is entered by bashing away at the keyboard. No thought need be given to spacing at the end of lines, as the computer does that automatically. If a word is going to be split, the computer holds it over until the next line.

The program can easily be altered to suit the individual's requirements. Once Run, delete lines 4, 5, 7 and 9, as these are no longer needed. Then resave the new program. If a toolkit of programs is to be kept in high memory, these can be protected by altering the value of *TP* in line 0.

Make sure to leave a buffer of about 250 bytes, to prevent the Editor insert routine from overwriting this area. Likewise if the program is shortened, the value of *ST* in line 0 can be lowered to increase the amount of text memory. If it is brought too low, the computer will run out of stack memory, so be careful. The width of the lefthand margin can be altered by changing *Z$* in line 0. Setting it to "" will leave no margin. ■

```
0 CLEAR200,7500:ST=7500:LO=ST:Z$=STRING$(5,
  &H0F):O1=ST:TP=32517
1 DEF FNA(X)=INT(X/256):DEF FNB(X)=X-INT
  (X/256)*256
2 CLS0:PRINT@169,"ESSAY PROCESSOR";:PRINT@
  455,"by";CHR$(128);"Peter";CHR$(128);"
  whittaker";
3 M1=PEEK(47)*256+PEEK(48)+30:REM**********
  *************
4 FOR A=M1 TO M1+19:READ A$:POKE A,VAL("&H
  "+A$):NEXT
5 DATA 8E,01,36,A6,80,81,8D,26,02,86,C9,8D,
  8C,A8,8C,01,38,25,F0,39
6 M2=PEEK(47)*256+PEEK(48)+31:REM**********
  ********
7 FOR A=M2 TO M2+15:READ A$:POKE A,VAL("&H"
  +A$):NEXTA:DATA 8E,01,36,FE,01,38,A6,
  80,A7,C0,8C,01,3A,25,F7,39
8 M3=PEEK(47)*256+PEEK(48)+31:REM**********
  **********
9 FOR A=M3 TO M3+17:READ A$:POKEA,VAL("&H"
  +A$):NEXT A:DATA FE,01,3A,10,8E,01,38,
  A6,C2,A7,A2,11,83,01,36,2E,F6,39
10 POKE329,0
11 PLAY"O3L100T100:AGDBCGFDAEOGFBAC":CLS:
   PRINT@12,"ENTER TEXT":PRINT
12 ' MENU
13 CLS:PRINT@5,"*********menu*********"
   PRINT:PRINT"1...@ DISPLAY TEXT ON SCREEN
   .","2...RT ARROW - TEXT TO PRINTER.","3.
   ..SHF RT ARROW - TEXT TO TAPE","4...SHF
   _ TAPE TO TEXT"
14 PRINT"5...^ FOR DELETE MODE.","6...DN
   ARROW FOR INSERT MODE.","7...CLEAR FOR
   SPECIAL CHARACTERS";"8...SHF ^ FOR MENU.
   ","9..._ TO BACKSPACE."
15 PRINT"10..SNF DN ARROW CURSOR TO END"
16 A$=INKEY$:IFA$=""THEN16ELSEIF A$=CHR$(64)
   OR A$=CNR$(94) OR A$=CHR$(10) OR A$
   =CHR$(8) OR A$=CHR$(12) OR A$=CHR$(9) OR
   A$=CNR$(21) OR A$=CHR$(93) THEN 20 ELSE
 GOTO 16
17 'inPut text
18 A$=INKEY$:IF A$=""THEN 18
19 IF A$=CNR$(95) THEN 13
20 IF A$<>CHR$(64) THEN 24ELSE CLS:FOR A=ST
   TO LOC-1:A$=CHR$(PEEK(A))
21 IF ASC(A$)<123 AND ASC(A$)>96 TNEN PRINT
   CHR$(ASC(A$)-32);:NEXT A:GOTO18
22 IF ASC(A$)<91 AND ASC(A$)>64 THEN PRINT
   CNR$(ASC(A$)+32);:NEXT A:GOTO18
23 PRINTA$;:NEXTA:GOTO18
24 IF A$<>CHR$(94) THEN 25 ELSE GOTO 52'^
   delete(lift text out)
25 IF A$<>CHR$(10) THEN 26 ELSE GOTO 61'
   insert text  down arrow
26 IF A$<>CHR$(8) TNEN 29 ELSE IF PEEK(137)
   <>0 THEN POKE 137,(PEEK(137)-1):LOC=L
   OC-1 ELSE POKE 137,255:POKE136,PEEK(136)
   -1:LOC=LOC-127:IF LK<LOC THEN LK=LOC+1
28 POKE VAL("&H"+HEX$(PEEK(136))+HEX$(PEEK
   (137))),128:GOTO18
29 IF A$<>CHR$(91) TNEN30 ELSE FOR B=LOC TO
   LK-1:PRINTCHR$(PEEK(B));:NEXT:LOC=LK
   GOTO18
30 IF A$<>CNR$(12) THEN 36 ELSE CLS:PRINT"
   ENTER SPECIAL 2 DIGIT CHARACTERS":PRIN
   T A$= " PRINT"0 TO ESCAPE","-1 TO BACK
   SPACE":PRINT
31 PRINT@96,"  PRINT@96,"";:INPUT A
32 IF A>0 AND A<256 THEN A$=A$+STR$(A)+" "
   PRINT@(510-LEN(A$)),A$:POKE LOC,A:LO
   C=LOC+1:GOTO31
33 IF A=0 THEN CLS:PRINT@0,"LETTER INPUT
   MODE":PRINT:GOTO18
34 IF A=-1 THEN LOC=LOC-1:A$=LEFT$(A$,LEN(
   A$)-4):PRINT@510-(LEN(A$)+4),"    ";A$;
  :GOTO31
35 GOTO31
36 IF PEEK(344)<>223 THEN 44 ELSEPRINT#-2,
   CNR$(13):POKE65495,0:A1=ST-1:L=80:A$=Z
37 A1=A1+1:IF A1=LO THEN PRINT#-2,A$:PRINT
   #-2,CNR$(13):POKE65494,0:GOSUB13:GOTO18
38 B=PEEK(A1):IF B=14 OR B=15 THEN PRINT#-2,
   A$:PRINT#-2,CHR$(B);:A$=Z$:IFB=14 TH
   EN L=40:GOTO37 ELSE L=80:GOTO37
39 IF B=13 THENPRINT#-2,A$:A$=Z$:GOTO37
   ELSE A$=A$+CHR$(B):IF LEN(A$)<L THEN37
40 B$=CHR$(B):IF(B$=" "ORB$=".'ORB$=","ORB$
   =";")THENPRINT#-2,A$;:A$=Z$:GOTO37
41 B$=CHR$(PEEK(A1+1)):IF(B$=" "ORB$=".
   ORB$=","ORB$=" ")THENPRINT#-2,A$;:A$=Z$
   GOTO37
42 FOR A=LEN(A$)TO LEN(A$)-20 STEP-1:B$=
```

```
    MID$(A$,A 1  IF(B$=" "ORB$= _"ORB$= ,"OR
    B$= ;")THEN43 ELSE NEXT
43 PRINT#-2,LEFT$(A$,A) A$=Z$+RIGHT$(A$,
    LEN(A$)-A) GOTO37
44 IF A$<>CHR$(93) THEN 47 ELSE CLS:PRINT
    @106 "POSITION TAPE" PRINT@142 '<ENTER>
    ' MOTORON AUDIOON EXEC41194
45 CLS PRINT@102,"SET TAPE TO RECORD':PRINT
    @142 "<ENTER>':EXEC41194:AUDIOOFF CSA
    VEM"WORDDATA ,ST LOC ST
46 CLS:PRINT@107 "TAPE SAVED":EXEC41194 CLS
    :PRINT@15 "WORD INPUT MODE':GOTO10
47 IF A$<>CHR$(21) THEN 48 ELSE CLS:PRINT@3
    "SET TAPE TO PLAY <ENTER>" EXEC41194
    PRINT PRINT:PRINT"LOADING":CLOADM LOC=
    PEEK(126)*256+PEEK(127)-1 A$=CHR$(64):GOT
    018
48 IF LO<TP THEN 50 ELSE CLS:PRINT@200,'TEXT
    MEMORY IS FULL' PRINT@420,"<ENTER>
    FOR MENU"
49 EXEC41194:GOTO13
50 POKE LOC ASC(A$):LOC=LOC+1 IF ASC(A$)<124
    AND ASC(A$)>96 THEN PRINTCHR$(ASC(A
    $)-32);:GOTO18 ELSE IF ASC(A$)<91 AND
    ASC(A$)>64 THEN PRINTCHR$(ASC(A$)+32);
    :GOTO18 ELSE PRINTA$; GOTO18
51 'delete text
52 D0=D1-240 IF D0<ST THEN D0=ST
53 D2=D1+240:IF D2>LO THEN D2=LO
54 GOSUB69:Y=X:GOSUB69 IFX<Y THEN Z=X:X=Y:
    Y=Z
55 POKE310 FNA(X) POKE311,FNB(X) POKE312
    FNA( ) POKE313,FNB(Y) POKE314,FNA(LO):P
    OKE315,FNB(LO)
56 EXEC M2:LOC=LO-X+Y
57 D0=D1-240:IFD0<ST THEN D0=ST
58 D2=D1+240:IFD2>LO THEN D2=LO
59 CLS:PRINT@240+D0-D1,"";:EXEC M1:A$=INKEY
    $ GOTO18
60 'insert
61 D0=D1-240 IFD0<ST THEN D0=ST
62 D2=D1+240 IF D2>LO THEN D2=LO
63 GOSUB69 POKE310,FNA(X):POKE311,FNB(X)
64 PRINT@240,"'; LINEINPUTA$ POKE312,FNA(
    LOC+LEN(A$ ) POKE313 FNB(LOC+LEN(A$)) P
    OKE314,FNA LO) POKE315 FNB(LO)
65 LO=LO+LEN(A$) EXEC M3
66 FOR A=1 TO LEN(A$) POKEX+A,ASC(MID$(A$,
    A 1)) NEXTA:SOUND200 1 SOUND190,1 SOUN
    D50,1
67 CLS:PRINT@240+D0-D1,"";:EXEC M1 A$=INKEY
    $ GOTO18
68 ' move cursor
69 X=159
70 POKE310,FNA(D0) POKE311,FNB(D0):POKE 312,
    FNA(D2) POKE313 FNB(D2) CLS PRINT@D0
    -D1+240,"";:EXEC M1 SF=0
71 IF PEEK(341)=223 THEN SF=1:D1=D1-32 IF
    D1<ST THEN D1=ST
72 IF PEEK(342)=223 THEN SF=1:D1=D1+32:IF
    D1>LO THEN D1=LO
73 IF PEEK(343)=223 THEN SF=1:D1=D1-1:IF
    D1<ST THEN D1=ST
74 IF PEEK(344)=223 THEN SF=1:D1=D1+1:IF
    D1>LD THEN D1=LD
75 D0=D1-240 IF D0<ST THEN D0=ST
76 D2=D1+240 IF D2>LO THEN D2=LO
77 IF SF=1 THEN 70
78 IF PEEK(338)=191 THEN SOUND 100 1 SOUND
    50,1:X=D1 RETURN
79 X=414-X POKE1264,X:GOTO71
80 '(C) PETER WHITTAKER 1983
```



NOW 2ND GREAT YEAR!
HIRE
ZX81/SPECTRUM
PROGRAM TAPES
JOIN OVER 2,000 DELIGHTED MEMBERS!
ADVENTURE GAMES
ARCADE and SIMULATION GAMES
BUSINESS and PRACTICAL PROGRAMS
UTILITIES
M/C COMPILERS
EDUCATIONAL AND MORE!
FREE ILLUSTRATED QUARTERLY MAGAZINE WITH TIPS, NEWS, REVIEWS DISCOUNT OFFERS PLUS OUR TOP 40 TAPES CHART
UP TO 2 WEEKS FOR ONLY £1.20 INCL FIRST CLASS POST and VAT!
CHOOSE FROM TAPES BY 40 TOP SUPPLIERS
YOUR FIRST TAPE FREE BY RETURN
IF YOU JOIN WITHOUT DELAY USING THIS SPECIAL COUPON!
THE ORIGINAL SINCLAIR LIBRARY
TO SINCLAIR OWNERS SOFTWARE LIBRARY Warren Road Liss, Hants GU33 7DD
NAME
ADDRESS
MACHINE
MAIN INTEREST

Filing system

Gary Foreman presents a simple program for the creation of data files

This program, *Data File* for the Commodore 64, allows the user to input information for a file. The program could be used for a name and address book or as a record of membership to a club.

In the program there is provision for 100 files but if it becomes necessary this can be changed (lines 20 and 1010). One hundred files takes a long time to write to tape — to speed things up you could input say, 25 files at a time but this would make it harder to look for a particular file.

It is also possible for a search to be carried out. All the user has to do is input an item of information and the computer will give all the file numbers containing that information. Information can be entered in any format, but commas are not allowed. If connected to a printer the program can write specific files to it — this could be used to make address labels etc.

The program will also work on the Pet and Vic20. On the Pet no changes are necessary, but on the Vic the screen will have to be readjusted and 3K of additional memory may be required.

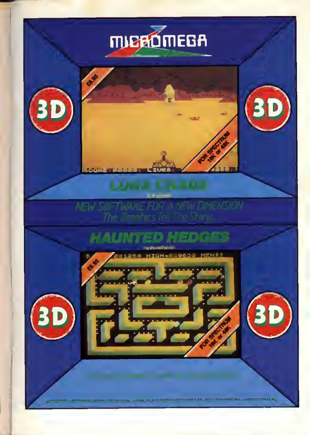
Variables

A$ — File
Q$ — Information for input
W$ — Menu
FIN — File number

Program notes

10 75	Initialisation of variables
100 250	Title and menu
1000 1950	Create new file
2000-2060	View a file
3000-3100	Write all files to tape
4000-4120	Read all files from tape
5000-5120	Write a file to printer
6000 6080	Correct a file
7000 7150	Search for a file
8000-8030	Ending routine

```
1 REM ****************
2 REM *              *
3 REM *  DATA FILE   *
4 REM *              *
5 REM * BY O.FOREMAN *
6 REM *              *
7 REM ****************
8 REM
10 REM * INITIALISE *
20 DIM A$(7 101)
30 Q$(1)="NAME.... ." Q$(2)="ADDRESS..." Q$(3)="TOWN
   .. .  " Q$(4)="COUNTY..  "
40 Q$(5)="POSTCODE ." Q$(6)="TEL.NO.   " Q$(7)="DATE
   ...
50 F$="[illegible]" D$="[illegible]" R$="[illegible]"
50 W$(1)="1 START NEW FILE" W$(2)="2 VIEW A FILE"
60 W$(3)="3 WRITE FILE TO TAPE"
65 W$(4)="4 READ FILE FROM TAPE" W$(5)="5 WRITE
  FILE TO PRINTER"
70 W$(6)="6 CORRECT FILE" W$(7)="7 SEARCH FOR A
   FILE" W$(8)="8 END PROGRAM"
75 FORQ=1TO7 FORQ1=1TO100 A$(Q Q1)="" NEXTQ1 Q
100 REM * TITLE / MENU *
110 PRINTD$ "****************"
120 PRINTR$ "*              *"
130 PRINTR$ "*   DATA FILE  *"
140 PRINTR$ "*              *"
150 PRINTR$ "****************"
160 PRINTR$ R$ F$ R$ " PRESS ANY KEY"
170 GETK$ IFK$=""THEN170
200 PRINTD$ "TTTT[illegible]" "* MENU *"
210 PRINT FORW=1TO8
220 PRINTR$ W$(W) NEXT
230 GETK$ K=VAL(K$) IFK$=""THEN230
235 IFK<1 OR K>8 THEN 230
240 ON K GOSUB 1000,2000 3000 4000 5000 6000,
    7000 8000
250 GOTO200
1000 REM * START NEW FILE      *
1010 FIN=FIN+1 IFFIN>100 THENPRINTR$ "NO ROOM FOR
     FILE" GOTO1950
1020 PRINTLEFT$(D$ 3) R$ "* FILE #" FIN "*"
1030 FORQ=1TO7 PRINTR$ Q$(Q) NEXTQ
1040 PRINT"TTTTTTTTTTTTTT" FORQ=1TO7
1050 PRINT "[illegible]" R$  INPUTA$(Q FIN)
1060 NEXT
1070 RETURN
1950 FOR T=1TO1000 NEXT RETURN
1999 END
2000 REM * VIEW A FILE          *
2010 INPUT"[illegible]WHICH FILE " WF
2020 PRINTLEFT$(D$ 3) R$ "* FILE #" WF "*"
2030 FORQ=1TO7 PRINTR$ Q$(Q) A$(Q WF) NEXT
2040 PRINTR$ F$ "PRESS SPACE TO CONTINUE"
2050 GET K$ IFK$<>" " THEN2050
2060 RETURN
2999 END
3000 REM * WRITE FILE TO TAPE    *
3010 PRINTLEFT$(D$ 3) F$ "INSERT DATA TAPE"
3015 PRINTR$ "REWIND DATA TAPE"
3020 PRINTR$ "PRESS SPACE WHEN READY"
3025 PRINTR$
3030 GETK$ IFK$<>" "THEN3030
3040 OPEN1 1 1 "DATA1"
3050 PRINT#1 FIN
3060 FORQ=1TOFIN
3070 FORQ1=1TO7
3080 PRINT#1,A$(Q1 Q)
3090 NEXTQ1,Q
3100 RETURN
3999 END
4000 REM * READ FILE FROM TAPE   *
4010 PRINTLEFT$(D$ 3) F$ "INSERT DATA TAPE"
4020 PRINTR$ "REWIND DATA TAPE"
4030 PRINTR$ "PRESS SPACE WHEN READY"
4040 GETK$ IFK$<>" "THEN4040
4050 PRINTR$
4060 OPEN1 1 0 "DATA1"
4070 INPUT#1 FIN
4080 FORQ=1TOFIN
4090 FORQ1=1TO7
4100 INPUT#1 A$(Q1 Q)
4110 NEXTQ1 Q
4120 RETURN
4999 END
5000 REM * WRITE FILE TO PRINTER *
5010 OPEN4 4
5020 INPUT"[illegible] FILE NO. " WF
5030 FORW=1TO2 PRINT#4 "" NEXTW
5040 PRINT#4 CHR$(14) SPC(6) "FILE NO.#" WF
5050 PRINT#4 CHR$(15)
5060 FORW=1TO2 PRINT#4,"" NEXTW
5070 FORQ=1TO7
5080 PRINT#4 SPC(10)Q$(Q),A$(Q,WF)
5090 NEXTQ
5100 FORW=1TO3 PRINT#4 "" NEXTW
5110 CLOSE4 4
5120 RETURN
5999 END
6000 REM * CORRECT FILE          *
6010 INPUT"[illegible]WHICH FILE" WF
6020 PRINTLEFT$(D$ 3) R$ "* FILE NO.#" WF "*"
6030 FORQ=1TO7 PRINTR$ Q$(Q) " " A$(Q WF) NEXT
6040 PRINT"TTTTTTTTTTTTTT"
6050 FORQ=1TO7
6060 PRINTR$ LEFT$(R$ 9)  INPUTA$(Q WF)
6070 NEXT
6080 RETURN
6999 END
7000 REM * SEARCH FOR A FILE     *
7010 PRINT "[illegible]" Y=0
7020 FORQ=1TO7 PRINTR$ Q ") " Q$(Q) NEXT
7030 INPUT"[illegible] WHICH DO YOU KNOW" K$
7035 INPUT "[illegible]WHAT IS YOUR INFORMATION" IN$
7040 K=VAL(K$) IFK<1 OR K>7 THEN 7010
7050 FORSE=1TOFIN
7060 IFA$(K SE)=IN$ THEN Y=Y+1 EU(Y)=SE
7070 NEXTSE
7080 PRINT "] THERE ARE " Y " FILES CONTAINING"
7085 PRINT "* " IN$
7090 PRINT "* THEIR NUMBERS ARE "
7100 FORSE=1TOY PRINTEU(SE)  NEXT
7105 PRINTCHR$(13)
7110 PRINT" WHICH DO YOU WISH TO VIEW"
7115 PRINT "* 0-RETURN"
7120 INPUTWF
7130 IFWF=0THENRETURN
7140 GOSUB2020
7150 GOTO7060
7999 END
8000 REM * END PROGRAM           *
8010 PRINTD$  INPUT"ARE YOU SURE" SU$
8020 IFSU$<>"Y"THEN RETURN
8030 END
```


MICROMEGA
£6.95
3D
FOR SPECTRUM 16K or 48K
LUNA CRABS
NEW SOFTWARE FOR A NEW DIMENSION
The Graphics Tell The Story....
HAUNTED HEDGES
HIGH
MEN
£5.95
FOR SPECTRUM 16K or 48K

"ADVENTURES INTO IMAGINATION"

AVAILABLE FROM W.H. SMITH, JOHN MENZIES, BOOTS

TRANSYLVANIAN TOWER

A spectacular 3-D maze adventure for the 48K Spectrum

RICHARD SHEPHERD SOFTWARE

RICHARD SHEPHERD SOFTWARE

NEW DEALERS WELCOME — RING JOHN SALTHOUSE ON 06286 63531



COLOUR CLASH for the 16K Spectrum

TIME DESTROYERS for the expanded Vic 20 (3K+)

ATOM SMASHER for the BBC and unexpanded Vic 20

GAMES THAT ARE HARD TO BEAT

UNEXPANDED VIC 20

Sea Invasion		£4.99
Mind Twisters		£4.99
Alphoids	NEW	£5.99
Insectors	NEW	£5.99
Power Blaster		£5.99
Shark Attack		£5.99
Space Fortress		£5.99
Space Attack		£5.99
Quadrant	NEW	£6.99
Atom Smasher		£6.99
Pedes and Mutants	NEW	£6.99
Multisound Synthesiser		£6.99
Martian Raider		£6.99

EXPANDED VIC 20 (3K, 8K or 16K)

Caterpillar	NEW	£5.99
Time Destroyers		£6.99
Moons of Jupiter		£7.99

ADVENTURES FOR THE VIC 20

Zorgon's Kingdom (8K or 16K) (real time graphic adventure)	NEW	£6.99
Sword of Hrakel (3K, 8K or 16K) (classic adventure)	NEW	£5.99
Golden Apple of Zeus (8K or 16K)	NEW	£4.99

COMMODORE 64

Zappy Zooks	NEW	£6.99
Dicky's Diamond	NEW	£6.99
Tombs of Xeiops	NEW	£6.99
Fools Gold	NEW	£6.99
Stellar Triumph	NEW	£6.99

FREE COMPETITIONS

Every action game [illegible] free entry into the national compet[illegible] the Supreme Champion and free entry into the annual Romik Grand Master competition with its fantastic prizes

FORTH for the 64 only £19.95

ELECTRON

Birds of Prey	NEW	£6.99
Atom Smasher	NEW	£6.99
Alien Break in	NEW	£6.99

BBC (Model A or B)

Alien Break in	NEW	£6.99
Birds of Prey		£6.99
Atom Smasher		£6.99

16K or 48K SPECTRUM

Colour Clash		£7.99
Galactic Trooper		£5.99
3D Monster Chase		£6.99
SpectraSmash (plus Breakout)		£6.99
Shark Attack		£5.99

ZX 81

Super Nine – 9 1K games		£4.99
Galactic Trooper (16K)	NEW	£4.99
Galaxy Jail Break (16K)	NEW	£4.99
Bubble Bugs (16K)	NEW	£4.99
Bank Robber (16K)	NEW	£4.99

DRAGON

Strategic Command	NEW	£9.99
Convoy Attack	NEW	£9.99
Cyclops	NEW	£9.99
Romik Cube	NEW	£9.99
White Crystal (graphic adventure)	NEW	£9.99

ORIC

Loch Ness Monster	NEW	£6.99

ATARI 400 OR 800

See Saw Scramble		£9.99

LYNX

Atom Smasher	NEW	£9.99
3D Monster Craze	NEW	£9.99
Floyd's Bank	NEW	£9.99
Power Blaster		£9.99

POWER BLASTER for the unexpanded Vic 20

SPECTRA SMASH for the 16K Spectrum

TOP PRICES PAID!

We're always on the lookout for new top quality machine code arcade games for any machine. If you have what you consider a marketable game let us know. Nobody pays higher royalties than we do.

ROMIK SOFTWARE

ROMIK

Romik Software, 272 Argyll Avenue, Slough SL1 4HE

Flowering art

***Michael Batty** explains how to introduce randomness into a program in the last of the series*

Having developed some reasonably fast techniques to draw fill and rotate ellipses in the last two weeks, we can now really begin to exercise our imagination through computer art

We will present a program which takes the regular flower-like designs generated in Program 2 last week and display these in different sizes with varying numbers of petals at random points on the screen

This is not as easy as it might sound because if you explored various designs using last week's Program 2 you will have found that many values of XX YY and N which determine the X and Y axes sizes and the number of petals did not give designs that look like flowers

Thus we require some structure to the way we introduce randomness to enable us to always generate flower-like pictures

The program listed here takes Program 2 from last week and strictly controls the way XX, YY and N are chosen First flowers based on a small number of broad petals or a large number of narrow petals are fixed in *Procord* or *Procunu* respectively Then the dominance of the X or Y axes is established in *Procfor* or *Procbak* and finally large or small sizes of flowers are chosen using appropriate functions to determine XX and YY

Line 110 of the program initially establishes a branch to *Procord* or *Procunu* and then branching takes place within these procedures from line 570 to the end Random values are chosen but within the overall limits set by these procedures

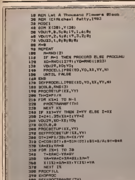
Despite the emphasis we have placed on speed the program might appear slow after 10 minutes some nice patterns have developed after 20, the picture is clearly becoming less formal To get 100 flowers the program would have to run for 40 minutes or so to get 1000 about six hours Computer art always disappoints as nice patterns are suddenly wiped out by new designs which evolve to nice patterns, and so on Of course, the answer is to stop it when you like it

Speed could be improved by only computing 15 rather than 30 co-ordinates of each ellipse, or by using an assembler but I feel the speed is about right. This illustration took 15 minutes to develop

Finally experiment with the program Change the shapes, the mode, the colours and the operation of the *Gcol* statement Scroll the screen If you have a spare colour tv set, you can set the program going and have the art of the future — a forever changing picture in the corner of your room! ■

continued on page 31





```
10 REM Let A Thousand Flowers Bloom
20 REM (C)Michael Batty,1983
30 MODE1
40 DIM X(30),Y(30)
50 VDU19,0,5;0;19,1,6;0;
60 VDU19,2,4;0;19,3,2;0;
70 VDU23,1,0;0;0;0;
80 M=0
90 REPEAT
100   M=RND(2)
110   IF M=1 THEN PROCORD ELSE PROCUNU
120   XO=RND(1279):YO=RND(1023)
130   VDU29,XO;YO;
140   PROCELLIPSE(XO,YO,XX,YY,N)
150   UNTIL FALSE
160 END
170 DEFPROCELLIPSE(XO,YO,XX,YY,N)
180 GCOL0,RND(3)
190 PROCSETUP(XX,YY)
200 TH=2*PI/N
210 FOR K%=1 TO N-1
220   PROCTRANSF(TH)
230   NEXT K%
240 IF XX>=YY THEN Z=YY ELSE Z=XX
250 Z=Z*1.25:XX=Z:YY=Z
260 VDU29,XO-XX;YO;
270 GCOL0,0
280 PROCSETUP(XX,YY)
290 DEFPROCSETUP(XX,YY)
300 DT=2*PI/30:A=XX/YY
310 C=COS(DT):S=SIN(DT):SX=S/A:SY=S*A
320 XA=XX:YA=0
330 FOR I%=1 TO 30
340   T=XA*C-YA*SY
350   YA=YA*C+XA*SX:XA=T
360   X(I%)=XA-XX:Y(I%)=YA
370   NEXT I%
380 PROCFILL
390 ENDPROC
400 DEFPROCTRANSF(TH)
410 C=COS(TH):S=SIN(TH)
420 FOR I%=1 TO 30
430   T=X(I%)*C-Y(I%)*S
440   Y(I%)=X(I%)*S+Y(I%)*C:X(I%)=T
450   NEXT I%
460 PROCFILL
470 ENDPROC
480 DEFPROCFILL
490 MOVE X(30),Y(30):MOVE X(1),Y(1)
500 PLOT85,X(29),Y(29)
510 FOR I%=2 TO 14
520   PLOT85,X(I%),Y(I%):J%=30-I%
530   PLOT85,X(J%),Y(J%)
540   NEXT I%
550 PLOT85,X(15),Y(15)
560 ENDPROC
570 DEFPROCORD
580 R=4+RND(4)
590 N=7+RND(7)
600 M=RND(2)
610 IF M=1 THEN PROCFOR ELSE PROCBAK
620 ENDPROC
630 DEFPROCUNU
640 R=15+RND(10)
650 N=30+RND(30)
660 M=RND(2)
670 IF M=1 THEN PROCFOR ELSE PROCBAK
680 ENDPROC
690 DEFPROCFOR
700 M=RND(2)
710 IF M=1 THEN XX=FNSF ELSE XX=FNBF
720 YY=XX/R
730 ENDPROC
740 DEFPROCBAK
750 M=RND(2)
760 IF M=1 THEN YY=FNSB ELSE YY=FNBB
770 XX=YY/R
780 ENDPROC
790 DEFFNSF=50+RND(30)
800 DEFFNBF=120+RND(40)
810 DEFFNSB=80-RND(40)
820 DEFFNBB=200+RND(50)
```

***Open Forum* is for you to publish your programs and ideas. Take care that the listings you send in are all bug-free. Your documentation should start with a general description of the program and what it does and then give some detail of how the program is constructed. We will pay the *Program of the Week* double our new fee of £6 for each program published.**

List

on Spectrum

This program is designed to list *all* Gotos and Gosubs and the line in which they originate

The program is useful for debugging and for following programs written by others

The program is only five lines long and should be merged with an existing program. It is started by the direct command *Goto* 9995 the variables used are unlikely to conflict with existing variables

Program notes

9995-	Prints heading sets the variables
Q	Main loop counter
Q1	To start of program area
Q2	To end of program area
Q3	Byte at Location Q
Q4	Contains first line number
9996-Q6	Contains line number until a new line is detected (Chr$ 13) The new line number is then loaded into Q4 The system variable newppc is poked with 9996 and the variable nsppc is poked with 5 or 8 This allows the program to jump over the next Q statement when the line number is greater than 9999 The main loop counter is incremented by 4 if a new line is detected and by 5 if a number (CHR$ 14) is detected Gotos (CHR$ 236) and gosubs (CHR$ 237) are detected
9997	Prints line number Builds goto/gosub destination in Q$
9998	Detects new line (CHR$ 13) and colon (Chr$ 58) as terminators of goto/gosub destination Prints destination
9999	Builds complex destinations in Q$

This program also demonstrates how a relatively simple program can be compressed into a small number of lines The original version was 21 lines long

The use of the system variables *newppc* and *nsppc* is a novel approach to conditional branching

```
9995 PRINT TAB 8,"GOTO/GOSUB OUH
P"''"LINE"' LET Q1=PEEK 23635+25
6*PEEK 23636  LET Q2=PEEK 23627+
256*PEEK 23628  LET Q4=PEEK (Q1+
1)+256*PEEK Q1  FOR Q=Q1+4 TO Q2
  LET Q3=PEEK Q
9996 LET Q4=Q4*(Q3<>13)+(PEEK (Q
+2)+256*PEEK (Q+1))*(Q3=13)  POK
E 23618,12  POKE 23619,39  POKE
23620,5+3*(Q4>9999)' LET Q=Q+4*(
Q3=13)+5*(Q3=14)  IF ((Q3=14) OR
 (Q3<>236 AND Q3<>237)) THEN NEX
T Q  PRINT '"END OF DUMP"' STOP
9997 PRINT Q4,  LET Q5=Q+1  LET
Q$=CHR$ (PEEK Q6)
9998 LET Q5=Q5+1  IF PEEK Q5=13
OR PEEK Q5=58 THEN PRINT TAB 6,C
HR$ (236+1*(Q3=237)),Q$  LET Q=Q
5-1  NEXT Q
9999 LET Q6=Q5  LET Q5=Q5+6*(PEE
K Q6=14)  LET Q$=Q$+(CHR$ (PEEK
Q5) AND PEEK Q6<>14): GO TO 9996
```

List
by M Booth

Character

on Oric

This program is an improvement and adaptation of the alternative character set mentioned on page 35 of the Oric manual.

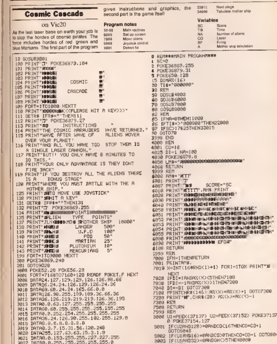
In some editions line 20 is incorrect and should read 20 PRINT N,CHR$ (27) "I" CHR$(N)

However, my program does not have the scroll which makes it inconvenient to look at as in the manual

This listing will display each standard character and the alternate associated with it Line 98 turns off the cursor To get it back when you have finished Type *Ctrl* Q

```
10 REM** ALTERNATE CHARACTER SET **
15 CLS'** BY P J AINSCOUGH **
20 PAPER0 HIRES
25 I=31
30 FOR K=0 TO 180 STEP 18 CURSET0,K,0
35 FOR J=1 TO 9
40 I=I+1 IFI>127THEN GOTO55
45 CHARI,0,1 CURMOV13,0,0 CHARI,1,1
50 CURMOV13,0,0
55 NEXT J
60 NEXT K
65 CURSET40,191,3
70 FOR L=1 TO 24
75 READM
80 CHARM,0,1
85 CURMOV7,0,3
90 NEXT L
95 DATA65,76,84,69,82,78,65,84,69,32
96 DATA67,72,65,82,65,67.84,69,82.32
97 DATA83,69,84,46
98 PRINTCHR$(17)
99 END
```

Character
by P Ainscough



Cosmic Cascade

on Vic20

As the last laser base on earth your job is to stop the hordes of cosmic pirates. The force includes hordes of red green and blue Martians. The first part of the program gives instructions and graphics, the second part is the game itself.

Program notes

50-90	Main routines
6000	Set up screen
7000	Move aliens
8000	Joystick control
8091	Detect hit
33015	Next stage
34000	Tabulate mother ship

Variables

SC	Score
TI$	Time
NA	Number of aliens
CO	Laser
BP	Firing
A	Mother ship tabulation

```
10 GOSUB9001
100 PRINT"" POKE36879,104
101 PRINT""
102 PRINT"                       "
103 PRINT"                       "
104 PRINT"          COSMIC       "
105 PRINT"                       "
106 PRINT"         CASCADE       "
107 PRINT"                       "
108 PRINT"                       "
109 FORT=1TO1000 NEXTT
110 PRINT"<<PLEASE HIT A KEY>>>"
111 GETR$ IFR$=""THEN111
112 PRINT"" POKE36879,27
113 PRINT"      INSTRUCTIONS     "
114 PRINT"THE COSMIC MARAUDERS  HAVE RETURNED."
115 PRINT"WAVE AFTER WAVE OF    ALIENS HOVER
    OVER YOUR PLANET'
116 PRINT"AND ALL YOU HAVE TGO  STOP THEM IS
    A SINGLE LASER CANNON."
117 PRINT"BUT!! YOU ONLY HAVE 8 MINUTES TO
    DO THIS."
118 PRINT"YOUR ONLY ADVANTAGE IS THEY DONT
    FIRE BACK"
119 PRINT"IF YOU DESTROY ALL THE ALIENS THERE
    IS A    BONUS STAGE"
120 PRINT"WHERE YOU MUST BATTLE WITH THE A
    MOTHER SHIP."
125 PRINT"TO MOVE USE JOYSTICK"
130 PRINT"HIT A KEY"
131 GETR$ IFR$=""THEN131
132 PRINT"" POKE36869,255
134 PRINT"POINTS"
135 PRINT"ALIEN     TYPE    POINTS"
137 PRINT"JLNKMO MOTHER SHIP  10000"
138 PRINT"          LANDER     500"
139 PRINT"           U.F.O     100"
140 PRINT"             POD     50"
141 PRINT"          MARTIAN    25"
142 PRINT"        PLUTONIUM    10"
143 PRINT"       MERCURIANS     5"
199 FORT=1TO3000 NEXTT
200 POKE36869,240
201 GOTO9028
9000 POKE52,28 POKE56,28
9001 FORT=7168TO7168+128 READF POKET,F NEXT
9008 DATA24,127,129,129,126,126,98,66
9009 DATA36,24,24,126,129,126,24,36
9010 DATA60,60,24,24,165,66,0,0
9011 DATA126,90,255,189,189,36,66,36
9012 DATA36,126,219,219,219,126,36,195
9013 DATA0,0,63,127,255,255,255,255
9014 DATA60,60,255,255,255,255,255,255
9015 DATA0,0,252,254,255,255,255,255
9016 DATA36,24,126,90,255,102,255,129,0
9018 DATA8,8,8,8,8,8,8,0
9019 DATA0,3,7,15,31,56,120,240
9020 DATA255,127,63,63,15,3,1,0
9021 DATA0,0,153,255,255,227,227,255
9022 DATA0,0,255,255,255,255,255,0
9023 DATA0,192,224,240,248,252,30,31
9024 DATA127,126,252,252,240,192,128,0
9025 FORI=7424TO7431 POKEI,0 NEXT
9027 RETURN
9028 PRINT"LOAD"
9030 POKE198,3 POKE632,19 POKE633,13
     POKE634,13
```

```
0 REM***MAIN PROGRAM***
1 SC=0
2 POKE36869,255
4 POKE36879,31
5 POKE650,128
15 DIMA%(16)
20 TI$="000000"
30 REM
50 GOSUB4000
60 GOSUB6000
70 GOSUB7000
80 GOSUB8000
82 REM
85 IFNA=0THEN11000
86 IFTI$=>"000800"THEN22000
87 IFSC>17625THEN33015
90 GOTO70
3998 END
4000 REM
4001 CO=10
4025 DI=1 NA=100
4030 POKE36878,8
4050 LM$=""
4060 RETURN
5999 REM
6000 AM$=""
6001 PRINT""
6007 PRINT"        SCORE="SC
6010 PRINT"",AM$ PRINT
6020 PRINT"'
6030 PRINT"AAAHAAAAA"
6040 PRINT"
6050 PRINT"HHC HHC HHC HHC"
6051 PRINT""
6052 PRINT""
6053 PRINT""
6054 PRINT""
6055 PRINT""
6080 PRINT"
6090 PRINT" EFG"
6100 RETURN
6999 REM
7000 IFN=1THENRETURN
7001 PRINTAM$,
7010 X=INT(16*RND(1)+1) FORI=1TOX PRINT"
     NEXT
7020 IFDI=1ANDA%(X)<5THEN7100
7030 IFDI=-1ANDA%(X)>1THEN7200
7040 DI=-DI GOTO7300
7100 PRINTCHR$(145) A%(X)=A%(X)+1 GOTO7300
7200 PRINT"",CHR$(20) A%(X)=A%(X)-1
7300 REM
7500 RETURN
7999 REM
8000 U1=PEEK(37137) U2=PEEK(37152) POKE37137,
     0 POKE37154,127
8001 IF(U2AND128)=0ANDCO<16THENCO=CO+1
     GOTO8040
8002 IF(U1AND16)=0ANDCO>0THENCO=CO-1 GOTO8040
8003 IF(U1AND32)=0ANDGH<>5THEN8080
8004 RETURN
8040 REM
8050 PRINTLM$,TAB(CO)" EFG ",
8070 RETURN
8080 BP=8120+CO+2 BC=BP+30720
8089 IFN=1THENGOSUB34000
8090 GOSUB7000
8091 IFPEEK(BP)=2THENSC=SC+50 GOTO8200
```

JUMBLY IS COMING!



YAHTCEE . . . This traditional dice is for one or more players and features superb graphics to enhance your enjoyment YAHTCEE is Fascinating, Absorbing and Challenging

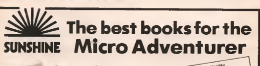
SPECIAL OFFER

Order YAHTCEE today for only £7 95 incl and get a 10-game cassette FREE

ANiK

30 KINGSCROFT COURT
BELLING, NORTHAMPTON

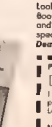
TICK BOX FOR YOUR REQUIREMENT: COM 64 | SPECTRUM 48 | DRAGON 32
YAHTCEE
NAME
ADDRESS
ENCLOSED TOTAL SUM





Spectrum Adventures

A major work by Tony Bridge and Roy Carnell which details the growth and development of Adventure gaming and then presents a full graphic Adventure game called 'The Eye of the Star Warrior'
ISBN 0 946408 07 6





Commodore 64 Adventures

A blueprint for the construction and playing of Adventure programs based on a full text Adventure
ISBN 0 946408 11 4

PUBLISHED JANUARY 1984

Atari Adventures

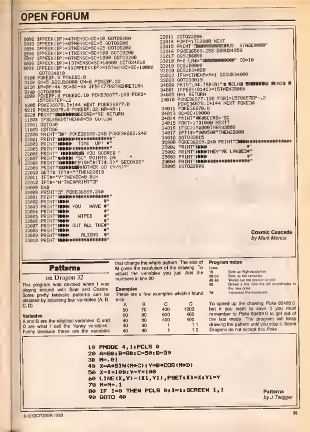
A guide to playing and writing your own adventures by Tony Bridge & Roy Cornell

Look out for the Sunshine range in W H Smiths Boots John Menzies other leading retail chains and through our national network of bookshops and specialist stores
***Dealer enquiries* 01-734 3454**

Please send me
☐ Spectrum Adventures at £5 95 each ☐ Commodore 64 Adventures at £5 95 each
I enclose cheque/postal order for £________ made payable to Sunshine Books 12/13 Little Newport St London WC2R 3LD

Name ____________________
Address ____________________

Signature ____________________
Or telephone Access Mastercard on 01-734 3454




```
8092 IFPEEK(BP)=4THENSC=SC+10 GOTO8200
8093 IFPEEK(BP)=8THENSC=SC+5 GOTO8200
8094 IFPEEK(BP)=3THENSC=SC+25 GOTO8200
8096 IFPEEK(BP)=1THENSC=SC+100 GOTO8200
8097 IFPEEK(BP)=0THENSC=SC+1000 GOTO8200
8098 IFPEEK(BP)=13THENSC=SC+10000 GOTO34010
8099 IFPEEK(BP)=11ORPEEK(BP)=15THENSC=SC+10000
     GOTO34010
8100 POKEBP,9 POKEBC,0
8120 GH=5 GOSUB8000 GH=0 POKEBP,32
8130 BP=BP-44 BC=BC-44 IFBP<7702THENRETURN
8140 GOTO8090
8200 POKEBP,8 POKEBC,10 POKE36877,190 FORI=
     15TO0STEP-.2
8205 POKE36878,I+144 NEXT POKE36877,0
8210 POKE36878,8 POKEBP,32 NA=NA-1
8220 PRINT"SCORE="SC RETURN
11000 IFSC=0625THENNA=59 UUIU30
11001 GOTO30
11005 GOTO86
22000 PRINT"' POKE36669,240 POKE36869,240
22001 PRINT"****************"
22003 PRINT"  TIME  UP! *"
22005 PRINT"****************"
22006 PRINT" YOU SCORED "
22007 PRINT" "SC" POINTS IN     "
22008 PRINT"RIGHT$(TI$,3)" SECONDS"
22009 PRINT"ANOTHER GO (Y/N)?"
22010 GETT$ IFT$=""THEN22010
22011 IFT$="Y"THENSC=0 RUN
22012 IFT$="N"THENPRINT""
30000 END
33000 PRINT"" POKE36869,240
33001 PRINT"****************"
33002 PRINT"              *"
33003 PRINT" YOU   HAVE *"
33004 PRINT"              *"
33005 PRINT"   WIPED    *"
33006 PRINT"              *"
33007 PRINT" OUT ALL THE*"
33008 PRINT"              *"
33009 PRINT"    ALIENS  *"
33010 PRINT"****************"
33011 GOTO22006
33014 FORT=1TO2000 NEXT
33015 PRINT"BONUS  STAGE"
33016 POKE36869,255 GOSUB4050
33017 GOSUB6000
33018 A=0 LA$="" CO=10
33019 GOSUB8000
33020 GOSUB34000
33022 IFN=1THENA=A+1 GOSUB34000
33023 GOTO33019
34000 PRINTLA$,TAB(A)"
34001 IFPEEK(8141)=15THEN35000
34005 N=1 RETURN
34010 POKE36877,190 FORI=15TO0STEP-.2
      POKE36878,I+144 NEXT POKE36
34011 POKE36878,8
34013 SC=SC+10000
34014 PRINT"SCORE="SC
34015 FORT=1TO1000 NEXTT
34016 IFSC>150000THEN33000
34017 IFTI$="000500"THEN22000
34018 GOTO33015
35000 POKE36869,240 PRINT"****************
35001 PRINT"              *"
35002 PRINT"THEY'VE LANDED*"
35003 PRINT"              *"
35004 PRINT"****************"
35005 GOTO22006
```

Cosmic Cascade
by Mark Menus

Patterns

on Dragon 32

This program was devised when I was playing around with Sine and Cosine. Some pretty fantastic patterns can be obtained by adjusting four variables (A, B, C, D)

Variables
A and B are the elliptical variables. C and D are what I call the 'funny variables'. Funny because these are the variables that change the whole pattern. The size of M gives the resolution of the drawing. To adjust the variables you just *Edit* the numbers in line 20

Examples
These are a few examples which I found nice

A	B	C	D
50	70	400	1200
60	80	600	400
40	80	400	400
40	40	1	1 1
40	40	1	1 2

Program notes

Lines	
10	Sets up High resolution
20-30	Sets up the variables
40-50	Works out the position to plot
60	Draws a line from the old co-ordinates to the new ones
70	Increases the increment

To speed up the drawing *Poke* 65495 0 but if you want to save it you must remember to *Poke* 65494 0 to get out of the fast mode. The program will keep drawing the pattern until you stop it. Some Dragons do not accept this *Poke*

```
10 PMODE 4,1:PCLS 0
20 A=80:B=80:C=50:D=50
30 M=.01
40 X=A*SIN(M*C):Y=B*COS(M*D)
50 X=X+100:Y=Y+100
60 LINE(X,Y)-(X1,Y1),PSET:X1=X:Y1=Y
70 M=M+.1
80 IF I=0 THEN PCLS 0:I=1:SCREEN 1,1
90 GOTO 40
```

Patterns
by J Twigger

Maths

on Spectrum

The idea is to save your friend from falling off a cliff. The program is aimed at children between 7 and 13. If your answer is correct, he moves away from the edge of the cliff by one character space. If your answer is incorrect, he moves two character spaces towards the edge of the cliff.

You have 10 questions in all, but it will only print your number of correct answers out of 10 if you save him. If your answer is incorrect it will tell you the correct answer.

Program notes

10-60	Asks which section you require
70-130	Selects chosen section
500-517	Asks which grade required
520-635	Finds the numbers for the questions you wanted
560-645	Finds correct answers
560-688	Prints questions and asks for answer
672-682	Responds to answer
687-688	Clears screen
690-692	Prints score out of 10 only if mate saved and produces display if mate saved
1510-3030	Multiplication zone (same as above)
3110-4999	Division zone (same as above)
5000-5500	Draws cliff and puts man on it
6000-7000	Moves man in a direction which is determined by whether you get the question correct
9000-9990	Sets up graphics
9900-9900	Moves man down cliff if insufficient answers correct
9960-9980	Checks if your mate has hit the bottom
9902-9999	Produces screen display if mate falls off cliff

```
   1 LET q=6: LET w=13
   5 GO TO 9000
  10 CLS : PRINT AT 0,0,"Welcome to Michaels maths lesson"
  20 PLOT 0,165: DRAW 255,0
  30 PRINT AT 4,4,"Which section do you want?"
  40 PRINT AT 7,7,"1  Addition"''"     2  Subtraction"
  50 PRINT AT 11,7,"3  Division"''"     4  Multiplication"
  60 INPUT "Input number you require ",s
  70 IF s>4 OR s<1 THEN GO TO 60
 100 IF s=4 THEN GO TO 1500
 110 IF s=1 THEN GO TO 500
 120 IF s=2 THEN GO TO 515
 130 IF s=3 THEN GO TO 3100
 500 CLS : IF s=1 THEN PRINT FLASH 1;AT 2,10;"Addition": PRINT AT 5,1;"How difficult do you want them?"
 510 IF s=1 THEN PRINT AT 8,9,"1  Easy"''"     2  Quite easy"''"     3  Quite hard"''"     4  Hard"
 515 IF s=2 THEN CLS : IF s=2 THEN PRINT FLASH 1,AT 2,10,"Subtraction": PRINT AT 5,1,"How difficult do you want them?"
 517 IF s=2 THEN PRINT AT 8,9,"1  Easy"''"     2  Quite easy"''"     3  Quite hard"''"     4  Hard"
 520 INPUT "Input level you require ",level
 525 IF level>4 OR level<1 THEN GO TO 520
 600 GO SUB 5000
 605 LET l=0
 609 LET f=0
 612 IF level=3 THEN LET y=INT (RND*135)+65
 615 IF level=3 THEN LET x=INT (RND*135)+65
 617 IF level=4 THEN LET y=INT (RND*799)+200
 619 IF level=4 THEN LET x=INT (RND*799)+200
 620 IF level=1 THEN LET x=INT (RND*15)
 625 IF level=1 THEN LET y=INT (RND*15)
 630 IF level=2 THEN LET y=INT (RND*50)+15
 635 IF level=2 THEN LET x=INT (RND*50)+15
 642 LET k=VAL "x+y"
 645 LET j=VAL "x-y"
 650 IF s=1 THEN PRINT AT 13,2,x," + ",y," ="
 655 IF s=2 THEN PRINT AT 13,2,x," - ",y," ="
 660 INPUT "Input your answer ",a
 670 PRINT AT 13,15,a
 672 IF s=2 AND a=j THEN PRINT INK 2,AT 13,20,"✓"
 675 IF s=1 AND a=k THEN PRINT INK 2,AT 13,20,"✓"
 676 IF s=2 AND a=j THEN LET l=l+1
 677 IF s=1 AND a=k THEN LET l=l+1
 678 IF s=2 AND a<>j THEN PRINT INK 2,AT 13,20,"✗"
 680 IF s=1 AND a<>k THEN PRINT INK 2,AT 13,20,"✗"
 681 IF s=1 AND a<>k THEN PRINT AT 15,2,"Wrong it was ",k
 682 IF s=2 AND a<>j THEN PRINT AT 15,2,"Wrong it was ",j
 683 GO SUB 6000
 685 PAUSE 125
 687 PRINT AT 15,2,"               "
 688 PRINT AT 13,15,"     "
 690 IF f=9 THEN PRINT AT 13,1,"You got ",l," out of 10"
 692 IF f=9 AND w<23 THEN PRINT AT 3,2,"You have saved him",AT q,w,"*"
 694 IF f=9 THEN PAUSE 1000: IF f=9 THEN RUN
 695 LET f=f+1: GO TO 610
1500 CLS
1510 PRINT FLASH 1,AT 2,8,"Multiplication": PRINT AT 5,1,"How difficult do you want them?"
1520 PRINT AT 8,9,"1  Easy"''"     2  Quite easy"''"     3  Quite hard"''"     4  Hard"
1530 INPUT "Input level you require ",diff
1535 IF diff<1 OR diff>4 THEN GO TO 1530
1537 GO SUB 5000
1542 LET l=0: LET f=0
1545 LET y=INT (RND*12)
1550 IF diff=1 THEN LET x=INT (RND*5)
1560 IF diff=2 THEN LET x=INT (RND*5)+5
1570 IF diff=3 THEN LET x=INT (RND*5)+10
1580 IF diff=4 THEN LET x=INT (RND*5)+15
1590 LET z=VAL "y*x"
1650 PRINT AT 13,2,x," * ",y," ="
1660 INPUT "Input your answer ",a
1665 PRINT AT 13,15,a
1670 IF a=z THEN PRINT INK 2,AT 13,20,"✓"
1680 IF a=z THEN LET l=l+1
1690 IF a<>z THEN PRINT INK 2,AT 13,20,"✗"
1700 IF a<>z THEN PRINT AT 15,2,"Wrong it was ",z
1705 PRINT AT q,w," "
1710 IF a=z THEN LET w=w-1
1720 IF a<>z THEN LET w=w+2
1730 IF w>22 THEN GO TO 9900
1740 PRINT AT q,w,"*"
1745 PAUSE 125
1750 PRINT AT 15,2,"               "
1760 PRINT AT 13,15,"     "
1770 IF f=9 THEN PRINT AT 13,1,"You got ",l," out of 10"
1780 IF f=9 AND w<23 THEN PRINT AT 3,2,"You have saved him",AT q,w,"*"
1790 IF f=9 THEN PAUSE 1000: IF f=9 THEN RUN
1800 LET f=f+1
3000 GO TO 1545
3100 CLS
3110 PRINT FLASH 1,AT 2,10,"Division": PRINT AT 5,1,"How difficult do you want them?",AT 8,5,"1  Easy"''"     2  Quite easy"''"     3  Quite hard"''"     4  Hard"
3120 INPUT "Input level you require ",diff
3130 IF diff<1 OR diff>4 THEN GO TO 3120
3140 GO SUB 5000
3150 LET l=0: LET f=0
3180 IF diff=2 THEN LET x=INT (RND*5)+5
3190 IF diff=2 THEN LET y=INT (RND*6)+5
3200 IF diff=3 THEN LET y=INT (RND*5)+12
3210 IF diff=3 THEN LET x=INT (RND*15)+15
3220 IF diff=4 THEN LET x=INT (R
```

```
ND*20)+10
3230 IF diff=4 THEN LET y=INT (R
ND*15)+25
3240 IF diff=1 THEN LET y=INT (R
ND*4)+1
3250 IF diff=1 THEN LET x=INT (R
ND*11)+1
3300 LET p=VAL "x*y"
3310 LET i=VAL "p/y"
3320 LET z=VAL "p/i"
3400 PRINT AT 13,2,p," / ",i," =
"
3410 INPUT "Input your answer ",
a
3415 PRINT AT 13,15,a
3420 IF a=z THEN PRINT INK 2,AT
13,20,"✓"
3430 IF a=z THEN LET l=l+1
3440 IF a<>z THEN PRINT INK 2,AT
 13,20,"X"
3450 IF a<>z THEN PRINT AT 16,2,
"Wrong it was ",z
3451 PRINT AT q,w," "
3453 IF a=z THEN LET w=w-1
3455 IF a<>z THEN LET w=w+2
3458 IF w>22 THEN GO TO 9900
3460 PRINT AT q,w,"Å"
3470 PAUSE 125
3480 PRINT AT 15,2,"
"
3490 PRINT AT 13,10,"          "
3500 IF f=9 THEN PRINT AT 13,1,"
You got ",l," out of 10"
3510 IF f=9 AND w<23 THEN PRINT
AT 3,2,"You have saved him",AT q
,w,"*"
3520 IF f=9 THEN PAUSE 1000: IF
f=9 THEN RUN
3550 LET f=f+1
4990 GO TO 3160
5000 CLS : PLOT 10,119
5010 DRAW 172,0: DRAW 0,-100
5020 PLOT 182,33: DRAW 70,0
5030 PRINT AT 6,13,"Å"
5500 RETURN
6000 PRINT AT q,w,"
6005 IF s=1 AND a<>k THEN LET w=
w+2
6007 IF s=2 AND a<>j THEN LET w=
w+2
6010 IF s=1 AND a=k THEN LET w=w
-1
6020 IF s=2 AND a=j THEN LET w=w
-1
6030 IF w>22 THEN GO TO 9900
6050 PRINT AT q,w,"Å"
7000 RETURN
9000 FOR f=0 TO 7: READ z: POKE
USR "a"+f,z: NEXT f
9010 FOR f=0 TO 7: READ z: POKE
USR "b"+f,z: NEXT f
9020 FOR f=0 TO 7: READ z: POKE
USR "c"+f,z: NEXT f
9030 FOR f=0 TO 7: READ z: POKE
USR "d"+f,z: NEXT f
9040 FOR f=0 TO 7: READ z: POKE
USR "e"+f,z: NEXT f
9500 DATA 0,1,3,7,142,220,248,48
+64
9510 DATA 195,231,126,60,60,126,
231,195
9520 DATA 56,56,16,56,84,56,68,6
8
9530 DATA 0,0,0,0,120,167,255,25
5
9540 DATA 56,186,84,56,16,56,68,
68
9800 GO TO 10
9900 LET q=q+1
9925 PRINT AT q,w,"Å"
9927 BEEP .1,10
9930 PRINT AT q,w," "
9950 IF q=17 THEN PRINT AT 3,1,"
You have not saved him!",AT 10,2
3,"SPLAT",AT q,w,"
9960 IF q=17 THEN GO SUB 9982
9975 IF q=17 THEN PAUSE 1000: IF
 q=17 THEN RUN
9980 GO TO 9900
9982 FOR f=0 TO 20
9983 PLOT 193,35
9985 DRAW INK 1,INT (RND*40)-20,
INT (RND*40)-20
9990 BEEP .01,f
9995 NEXT f
9999 RETURN
```

Maths
by Michael Kay

Cheracter

on Dragon 32

Thses two programs try out and then demonstrate new character shapes for games

In program 1 you try out shapes A useful source of new characters for use in games are listings from other computers particularly Vic and Spectrum Look in the program notes to see where the user befined graphics are created and enter them into the program in groups of eight

If you like the characters press the L key for a list of the characters numbers Use these numbers in program 2 in line 60 Dont forget to *Dim* the amount of space you need at the beginning

Program notes

10	Set mode (mode 4 best)
20-30	*Dim* shape
40-60	Enter numbers and error trap
70-100	*Poke* character on hi-res screen
110-120	*Get* and *Put* character
130-160	User prompts
5	Set mode
10-40	Read *Data* and *Poke* character
50	Get character
60	Data

```
5 REM*** PROGRAM 1 ***
10 PMODE 4,1:PCLS:CLS
20 DIM SHAPE(7,7)
30 PRINT TAB(6);"CHARACTER CREATOR"
40 FORI=1TO8
50 PRINT"NO.";I;:INPUT A(I)
55 IF A(I)<0 OR A(I)>255 THEN PRINT"INVALID INPUT":GOTO 50
60 NEXT
70 SCREEN1,1
80 FORI=1 TO8
90 POKE 1536+32*I,A(I)
100 NEXT
110 GET(0,0)-(8,8),SHAPE,G
120 PUT(100,100)-(108,108),SHAPE,FSET
130 A$=INKEY$:IF A$="" THEN 130
140 IF A$<>"L" THEN CLS:GOTO 30
150 FORI=1TO8:PRINT I;A(I):NEXT
160 GOTO 130
145 CLS

3 REM *** PROGRAM 2 ***
5 PMODE4,1:PCLS
10 FORI=1TO8
20 READ A
30 POKE 1536+I*32,A
40 NEXT I
50 GET(0,0)-(8,8),SHAPE,G
60 DATA 255,129,129,129,129,129,129,255
70 REM** THIS GIVES A BOX **
```

Character
by S Dundon

Score Countar

on ZX81

This is a useful machine code subroutine which could be used in many programs

At the beginning of your program enter the loading part of the listing (including a Re[illegible] at line 1) Then run the program so that the machine code can be loaded into the *Rem* statement

Once the program has been run you can belete the loader program but not the *Rem* statement

When in the program itself the screen display is shown A number of zeros (any [illegible]

Directly before the zeros, a black square *CHR$ 128* is needed

When in the program you need to increment the score, simply use *Rand Us[r]* *16514*

If the score gets full ie, more than 999[9] the counter is automatically reset This is why the black square needs to be [illegible]

Russian roulette

A host of Spectrum adventures have been released lately, and I really must take time to look at some of the programs. Before starting this week's perusal, however, a bit of a grovel!

After our running commentary of *Zodiac* for the Oric 1, from Tansoft Mr Fitzgerald of A & F Software has written to take me to task for some of the things that I said. He was right in pointing out that I contradicted myself by saying first of all, that Tansoft's was "as far as I know, the only adventure for the Oric so far available", and then going on to say that the *Zodiac* under discussion was not the A & F version!

I stand corrected, A & F — there are of course other adventures available for this machine. I should have said that Tansoft's *Zodiac* is the only one that anyone has so far written to me about (and there has been quite a lot of mail concerning this one).

Back to the latest adventures for the Spectrum — the first tape is not actually new. In fact the programs found on the tape have been around for a long time, but I think it might be as well to get them aired. Mikrogen probably best known at the moment for *Mad Martha*, also have these two adventures in their lists — *Mines of Saturn*, and *Return To Earth*. The scenarios are linked and obviously have a space theme, concerning your adventures on Saturn, on to which you have crashed.

In the first program your task is to find good old Dilithium crystals to refuel your stranded ship (Starfleet Command could probably help you there). If you're successful in this, you then go on to the next program in which you explore a sinister deserted space station in order to tell Earth of your predicament.

The plot sounds like a good one around which to build an adventure, but unfortunately Saturn Developments, who wrote both the present programs and *Mad Martha* have not done the theme justice. *Mines of Saturn* refused to load for me, but I imagine it is much the same as the other program. There is a dire warning against capital letters at the start ("They will NOT be accepted" — they were), and then you are told of your initial position which is the wrecked control room with four corridors leading off. No directions are given but we can assume that they lead off at the cardinal points of the compass.

The program is written in Basic and the response times are rather slow so a lot of finger-tapping is done while waiting for the program to think! More damning, to my mind, is the way in which the player is suddenly told "Poisonous spiders sting you — you are dead". If this happens, the program just stops, and dumps you back into Basic no warning of any kind is given that this is going to happen. That is not adventuring, it's Russian Roulette!

Apart from this the program is just plain boring — for £5.95 better save your money for *Mad Martha 2*! If you enjoyed the first part of this crazy adventure you will be sure to love the follow-up (*Hungry Horace* certainly seems to have started a trend).

The scenario of this part of poor old Henry's life has him off to the beaches of Spain with his wife and son for a spot of the nightlife in Torremolinos. The mix is the same as before: a few high-resolution graphics, a few doors to choose from and several arcade-type games sprinkled amongst the puzzles. I haven't had time to get far into the adventure but you will know if you want to see more of Martha and Henry.

From Computer Rentals comes *Rescue* by D C B Baker. There are no instructions on the cassette apart from how to *Load* the thing, but the first part of the program is a massive instruction manual, which will have your brain reeling from trying to digest all the details. Many programs now use this as a way of saving memory (with 48K to play with — remember when 16K seemed more than enough?). There's nothing wrong with this, but the present program does not give a condensed *Help* page in the main program, which would certainly have been a bonus. So, write everything down before going on to the game itself.

This turns out to be rather good — not strictly an adventure but more of a strategy game. Your task is the age-old one, to rescue the princess from her prison in the castle, blah yawn — why not an adventure to imprison the prison the princess much more appealing! Anyway to rescue her, the player moves around a network of five concentric rings exploring the locations dotted around them and picking up objects which will be of use in the later parts of the game. This is where your cribbed instructions will come in handy — if you've forgotten to write them down, you will forget what you need at various points.

Eventually if you have collected the right things you will be able to cross over to the castle (you'll have to find the location yourself by playing a silly little guessing game with the computer).

Win the game and you can enter the castle. This has 12 rooms, on four levels and the princess in one of them. Then you must retrace your steps back to the starting point. Don't worry about getting lost — in the initial stages you will have found a map and you may call up the layout of the playing grid whenever you like (although a few points are lost for doing so). You may also find a radio a gun, torch, rope ladder knife and so on. By the way, two patrols do their best to kill you.

I recommend this game as a welcome and well-written diversion from the usual adventure.

Workforce is a software house that has quite a large catalogue of varying programs the more successful of which are, to my mind the utility titles. They have sent along for review two new adventure titles *Pirate Island* and *Devil's Revenge*. This last title is one of those programs in which the player has to work his way around a network of interconnecting lines all the time being set problems in order to progress. The idea first surfaced with *Nightmare Park*, from Macronics. This one is rather similar.

At every other step, on average, the player is plunged into what the author would probably claim is an arcade game — if successfully completed the player may carry on to the next one and so work his way toward the end of the network.

Actually I am only guessing at what happens at the end of all this. Terminal boredom set in after about five minutes — the games are all (at least all of the half-dozen or so I kept awake for), in Basic and of the most useless sub-Interlace *Scrolling* type.

The other program is a text adventure *Pirate Island* is written by G G Wilson who sets a nice atmosphere right from the start by saying "*Thank you*" when you "*Press any key to start*". The adventure follows the well-trodden path of "*You are in a clearing. Exits North and South. You see nothing. What next?*" The responses are quick although many of the usual words don't seem to be recognised. After typing in your choice of direction the screen fills with colourful hash marks which then clear to show the next location.

If several commands are typed in quickly the program soon gets confused and the answers flash by too fast for the player to read. All the old favourites are here such as the bag of gold the rusty torch and so on. But the C cursor is definitely not accepted, you will be sharply told off for your impertinence!

If you are an avid collector of the traditional text adventure, this one should fill a few evenings with its puzzles.

Next week, I shall look at more Spectrum adventures. ■

The series of articles is designed for novice and experienced Adventurers alike. Each week Tony Bridge will be looking at different Adventures and advising you on some of the problems and pitfalls you can expect to encounter. So if you have an Adventure you want reviewed or if you are stuck in an Adventure and cannot progress any further, write to Tony Bridge, Adventure Corner, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.



COMPUTER SCEPTIC

T Marsh of Roding Ride Wolverhampton writes

Q **A friend of mine has a small business He is having problems with the SSP — statutory sick pay He is sceptical about computers and, in a rash moment, I said that my computer could do his SSP Unfortunately, he took me up on it I thought I had seen a program for SSP on the Spectrum, but now I'm not so sure. Is there one?**

A Yes Hilderbray, who do a range of business software for the Spectrum, have one Hilderbray can be found at 8/10 Parkway, London NW10 7AA Let us hope that this leads to one less computer sceptic

VALID GUARANTEE

Steve Palmer of Denham Green Close, Denham Green, Uxbridge Middlesex, writes

Q **I am writing this letter about the telesound Spectrum sound booster The advertisement in *Popular Computing Weekly* says that 'three easy snap-on connections eliminate soldering'. What I would like to know is whether you have to take the Spectrum apart to fix the device? If so, I would like to know if my guarantee would be invalidated?**

If this is the case, could you let me know of another sound booster that does not invalidate my guarantee? Also, could you let me know if there is a compiler available for the Spectrum?

A As soon as you take the top off your Spectrum you invalidate the guarantee The advantage of the telesound booster is that there is no sign that anything has been done to the computer The three chips are very easily removed, and all you then have to do is re screw the top If you still want another sound amplifier, then there is the Fuller sound box This is more expensive, but gives you more for your money in that it also acts as a port

I covered compilers recently No compiler will compile absolutely everything but both Softek and PSS make reasonable ones

Fuller is based at the ZX Centre, Sweeting Street, Liverpool, Softek at 12/13 Henrietta Street, London WC2, and PSS at 452 Stoney Stanton Road Coventry CV6 5DG

OPERATING SYSTEM

Francois Hardy of Bothwells Bracknell Berkshire, writes

Q **I have a BBC B with the old 0 1 operating system, which I would like to change for a 1 2 I am sure that I have seen somewhere that this should be exchanged free of charge, though I was quoted £11 50**

The thing is, I bought my computer second-hand, so do I have to pay? Also, someone I know who has a 0 1 OS paid to get it changed Who is right?

My computer gets very hot at the back I have had little trouble, but it is a bit worrying. Is it all right?

A I have also seen the same information though I have no knowledge of anyone else being successful The 0 1 OS does not meet the published specification Therefore Acorn are technically in breach of contract by selling goods that are below the pub lished standard This far I am sure your local trading standards officer will back you up In law, the fact that the 1 2 exceeds the published standard is not an issue

In your case however I am not sure that it will apply because at the point of sale you bought the machine as it stood and that therefore is in effect the published standard It might be worth talking to your local trading standards officer, in case there is a way round this, though I do not hold out much hope

I do not know the precise cause of the overheating It sounds as if the system is being overloaded or that a component is faulty On the whole, the BBC power supplies have a good name

SECRET PASSWORD

Edward Dubois of Kellock Crescent, Old Monkland, Coatbridge writes

Q **I recently took the plunge and bought a 16K ZX81 and have spent endless hours learning how to use it A friend also has the same, but I could not Run any of his many copied programs because he had a password in them which was "*AT AT 6000*". As I know his password, I could then use them**

He has now gone to Australia and left me all his software, which I can of course use, but I am intrigued as to how he did it And, though he promised to tell me before he went, he did not I would like to do something similar Can you tell me how to write the codeword program in Basic so that I can use it in my own programs, or at least tell me what he did?

A I think I can tell you what he did, but not how to do the same in Basic There is probably a machine code routine in a Rem statement that reads the keyboard, as soon as the program is *Loaded* You do not say if the programs auto run, but I presume they do

This routine would scan the keyboard for the correct code, and continue to do so until it was put in then it would return to Basic and carry on with the normal execution of the program Presuming that the Rem statement is at the start of the program, you would want to finish the program with three lines like

SAVE p	Where p is the name of the program line
RAND USR 16514	This takes you to the first byte of the program (assuming that the Rem statement holding the Machine Code is at the start of the program)
GOTO n or RUN	This starts the program running after it has been Loaded and the keyboard scan has been done

Goto n, where *n* is the first line number of the program proper, is used in preference to Run, because you might have to protect data, which Run would wipe out

AMERICAN OVERLOAD

Philip Allmendinger of Milgrove Road, Stonewood Aberdeen, Scotland, writes

Q **My father is going to Dallas in a few weeks, so I have asked him to get me a Commodore 64 there But, he says that it will not work on our electricity, or on our TV system Is he right?**

Also, would he have to pay anything at customs for bringing it into the country?

A Your father is right it would not work over here The American electricity supply is 110 volts while ours is 240 The computer would be overloaded if you plugged it in and very likely catch fire! You would need a special transformer to guard against this

Also, the American television system is different to ours They have 525 lines running at 60Hz, ours is 625 lines at 50Hz This would throw out all the timings because the American system would try and scan the screen 10 times more per second than our system can handle It would then try and put the results into a smaller format (525 lines)

By the time you have got a special transformer, and brought back an American television set as well, you will find it much cheaper to buy your computer over here

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Ian Beardsmore and every week he will *Poke* back as many answers as he can The address is *Peek & Poke*, PCW, 12-13 Little Newport Street, London WC2H 3LD.





A Pools Prediction Program for the 48K ZX Spectrum microcomputer. The program [illegible] to the recent form of the teams playing in each week's English and Scottish football league matches and then refers to a large database to see what has happened in the past when teams with similar form met. It can thus identify the matches which are likely to yield draws and output suitable predictions.
The program is supplied complete with a database tape containing data on over 7 800 matches and a comprehensive instruction manual.
For £12 95 inclusive (cheques/POs payable to B. McAlley)
SPECTADRAW 1 COWLEAZE, CHINNOR, OXFORD OX9 4[illegible]

ZX81, SPECTRUM, DRAGON BBC AND VIC
SOFTWARE LENDING LIBRARY

We have for hire from **50p** (including postage) programs for your computer

£5 for life membership (less than the cost of a single game) brings you the Software Lending Library membership kit including catalogue, newsletter

All tapes lent with full manufacturer's permission.

Send a cheque or postal order for **£5** to **Software Lending Library,** PO Box 3, Castleford, West Yorks stating name, address, and computer type

Spectrum Software 48K

Wargames
Pacific War £6 00

Refight the aircraft carrier battles of World War 2 The player controls the American forces your computer the Japanese Full screen display of task force and aircraft movement.

Management Games
Bankrupt £8.00

For one to four players with one two or three computer opponents
An absorbing simulation of commercial life in which the sole player is up against not one but three computer controlled companies

Cheques or Postal Orders to: K W Software 155 Ringinglow Road, Sheffield B11 7PS

POOLS PREDICTION
POOLSWINNER

The most sophisticated Pools Prediction Aid available. Gives probabilities of score draws, draws, homes or aways, based on two databases holding over 20 000 matches (databases included with program).
The databases are automatically updated as results are entered.
Can be used in simple mode, or with parameter adjustments to develop your unique forecast method.
Fully documented, available now for Apple II /IIe, Spectrum (48K) Dragon, ZX81 (16K) BBC'B' and CBM 64 (issues — please enquire)
£15.00 (discs/tapes)

POOLSDATA

Complete record of all English Football League matches 1978-83. Teams, scores, dates of 10 000 matches held in unique format, ready for your analysis. Starter analysis programs and full documentation included. Available for Apple, Spectrum, ZX81, BBC, Dragon, Commodore series.

Discs (5 year) £15.00
Tapes (5 year) £12.50
Tapes (2 year) £8 70
all prices (p&p included)

SELEC SOFTWARE (PCW)
37 Councillor Lane, Cheadle, Cheshire 061-428 7425

OWL TECHNICAL SERVICES LTD

C15 HOME COMPUTER CASSETTES
EACH CASSETTE COMPLETE WITH SIDE LABELS INDEX CARD AND LIBRARY BOX

10 Cassettes	£4 80 (P+P £0.95)
50 Cassettes	£23 30 (P+P £2 00)
100 Cassettes	£46 00 (P+P FREE)

Cheque/PO payable to
OWL TECHNICAL SERVICES LTD
PROGRAM DUPLICATION SERVICE ALSO AVAILABLE

Trade enquiries welcome

121 Northcote Road, London SW11
Tel 01 228 4169

VCS ATARI 400/800
Vic20 • PHILIPS
INTELLIVISION
CARTRIDGE LIBRARY

AUTHORISED DEALER

- All the latest games
- Fast reliable service
- Life membership now £10
- Descriptive catalogue
- Fortnightly or monthly hire
- p&p inc. in hire charges
- Discount on purchases for members (hardware and software)

HIRE CHARGES 2 WKS £3 00 — 4 WKS £5 00
JOIN NOW ON MONEY BACK APPROVAL
OR SEND SAE FOR DETAILS
To MDM HOME COMPUTER SERVICES, DEPT 5
20 NAPIER STREET, NELSON, LANCS BB9 0SN

POPULAR Computing WEEKLY Back Issues

Almost all the copies of **PCW** that you missed can still be bought as back issues for only 50p including postage and packing.
An **index** of the contents of the 50 issues published in 1982 is now available from the Publishers for only £1.26. It includes full details of all the programs, features, reviews and news that you might have missed.

Please send me the following back issues at 50p each
______________________ Total £ ______
Please send me a copy of the 1982 PCW index at £1.26 ☐
I enclose a cheque/postal order for £ ______
Name ______________________
Address ______________________

Please return to Back Issues PCW 12-13 Little Newport Street London WC2R 3LD

CLASSIFIED

Semi-display — £5 per single cc
Trade lineage — 20p per word
Private lineage — 10p per word

CALL *DIANE DAVIS* ON *01-734 2688* FOR SEMI-DISPLAY ADVERTISING



GAMES SOFTWARE

SM — **ROBOT PANIC** for your 16 48K **SPECTRUM**

Zap the aliens Items the walls crush your Robot Five rooms of escalating infestation — can you beat it? £5 from retailers (ask) or direct (24 hour despatch)
Soft Mill 20 Station Pores Haddenham Ely Cambs CB6 3XD

ZX SPECTRUM SOFTWARE

We are offering 10% off one or more tapes in a range of software for the ZX Spectrum

Telephone or SAE for list

We are also offering Jetpac Pssst, Trans-am and Cookie by Ultimate Play the game for £5 each inclusive of postage and packing!

RULE COMPUTERS
30 Tylers Acre Road
Corstorphine Edinburgh,
EH12 7HZ.
Tel 031-334 7261

SPECTRUM PROGRAMS

BACKGAMMON	£6.95
3D VORTEX	£5.95
3D TUNNEL	£6.95
HEATHROW	£7.95
NIGHT FLITE	£5.95
GNASHER	£4.95
ARCADIAN	£4.95
ESCAPE	£4.95

Many others. SAE for list
Prices including p&p
Cheque/POs crossed payable to
VYAJY'S H-K
11 MARGARET AVENUE
ST AUSTELL, CORNWALL

WHO IS THIS CAPTAIN PHOENIX?

Avalon Computing

A COMPREHENSIVE RANGE OF SOFTWARE TITLES SPECTRUM 16K 48K VIC20 DRAGON ORIC COMMODORE 64 BBC ATARI 400/800

EG	Jet Pac (Spectrum)	£4 99
	Krazy Kong (Vic20)	£6.49
	Zzoom (Spectrum)	£6 99
	Oric Chess Zodiac	
	(RRP £9 99) £5 99 (incl VAT)	

Plus 100 more tiles at competitive prices Send a large SAE for catalogue P&P 50p per order or free for two tapes.

AVALON COMPUTING 14 CLIFF ROAD HORNSEA, N HUMBERSIDE HU18 1LL Tel 04012 2791

GAMES LIQUIDATION! Hundreds for Apple Atari TRS 80 IBM and Dragon Nothing over £15 Tel 0992 468870 (eves)

TRS-80/GENIE GAMES! Nothing over £10 Tel 0992-468870 (eves) for full list.

CHIPSOFT BUSINESS PACKAGE for Atari P.A.Y.E. sales and purchase ledgers stock control £190 Tel 0992-468870 (eves)

LEARNING TO DRIVE?
DRIVING WHO THINKS HE KNOWS IT ALL?

LEARNER DRIVER
16K Spectrum
(FREE Highway Code)

Two fascinating educational/fun programs from a professional driving school on one tape

PASS YOUR TEST

Driving Test Simulation Are you good enough to pass first time?

and

KNOW YOUR SIGNS

Test your knowledge of the Highway Code Both 16K programs on tape. Unique and excellent value at an inclusive price of £6 00 Cheques to **M J Hawkins D O T A B I M I A M** Sarum £3 Cherwell School of Motoring (Est 1974) Bons Rhine Market Sarum Northamptonshire

LATEST TAPE for Vic20 Contains many programs and games Special offer one month Send only £3 55 to E Moores 46 Armadale Road Dukinfield SK16 5AG

ROBIN HOOD

Can you win an archery tournament? Seize a castle? Follow a forest trail or explore secret passages? Yes — then escape into the Greenwood and rescue Maid Marion from her oppressors with our cassette adventure for the DRAGON 32

Send cheque or postal orders for £5 95 to **PORTENT ADVENTURES 6 Park land Row Edwinstowe Notts NG21 9JB**

EXPAND YOUR ZX81 to its limits Horse Racing Forecast, Love Rating Fruit Machine, all with excellent features on cassette for £2.50 each or all three for just £5 Send Cheques and POs to M McFagan 48 Ballards Green Burgh Heath Tadworth Surrey

ULTIMATE

New programs for 48K Spectrum

ATIC ATAC £4 99
LUNAR JET MAN
including VAT and P&P

FLOWCHART LTD.,
60 High Street Irthlingborough Northants.

All leading software available at more than 10 per cent discount.
Tel 0933-650079 or SAE for lists stating which microcomputer

VIC20 OWNERS Six quality Arcade games only £6 inc P&P ie Asteroids Superlander etc Hurry while offer lasts Cheques and POs to Chamberlain 23 Chesnole Close Canford Heath Poole Dorset BH17 9BD

TI99/4A ADVENTURE program hours and hours to solve explore many routes £3 inc P&P 30 Brown Cress, Sutton-in-Ashfield Notts NG1 7GY

NEW THE LATEST AND GREATEST Pacman Game Spooks Attack for the 16K 48K Spectrum only £3 95 Direct from Simba Software 38 Springett Avenue Ringmer East Sussex

48K SPECTRUM, four months old over 65 games plus magazines £114 Weybridge 52941

SPECTRUM SOFTWARE Many of the best games all at 50 per cent off original price 69 Bedford Court Shadsworth Road Blackburn Lancs

48K SPECTRUM CRICKET CAPTAIN. Captain your county through a limited overs competition Choose side place field change bowlers Features 3D action Save facility 10 levels £4 10 To Allanson Computing 77 Chorley Road Adlington Chorley Lancashire

SPECTRUM 16K. Raquel presents her two for one game for age 16 and over only state age when ordering still only £2.95 I Brooks 17 Malvern Coleman Street Southend Essex

UTILITIES

STOP! LOOK! LISTEN!

STOP searching for a TOP QUALITY tape to tape copier for the SPECTRUM (16-48K)

TAPE COPIER

we are certain is the MOST ADVANCED copier available Does any other copier come near?

LOOK at ONLY SOME of its options

- Copies up to approximately 47 7K (15 7K for 16K Spectrum)
- Verifies Repeat Copies Auto Abort and STOPS programs
- Loads CONTINUOUSLY (not just one part at a time like most copiers) even without pressing a key!
- Copies HEADERLESS and ALL programs that we are aware of!
- Very user friendly and simple to use

LISTEN to this We are so convinced you will be delighted with our product that we can offer a FULL MONEY BACK GUARANTEE if not fully satisfied. Cost ONLY £4 50

LERM Dept PW 10 Brookside Drive Cottingham Market Harborough Leics

TELETEXT ON YOUR SPECTRUM create your own 900-page teletext system with ZXTEXT Full colour graphics flashing 24 hour clock with alarm free sample system — it's all here! Cassette £4 95 **Z6 Puzzle** 3D version of Sam Loyd's famous 15 Puzzle with full-colour 3D display Try to sort the cubits into order Cassette £4 95 Or both for £7 40 Iain Stewart, 17 Torry Drive Alva FK12 5NQ

CLASSIFIED ADVERTISING RATES:

Line by line 20p per word, minimum 20 words

Semi-display £5 per single column centimetre minimum length 2 cm (Please supply A/W as PMT Or supply rough setting instructions)

Conditions All copy for Classified section must be pre-paid Cheques and postal orders should arrive at least two weeks before the publication date

If you wish to discuss your ad PLEASE RING Diane Davis 01-734 2688

Here's my classified ad.

(Please write your copy in capital letters on the lines below.)

		Please continue on a separate sheet of paper	

I make this ______ words at ______ per word so I owe you £ ______

Name ______

Address ______

______

______

Telephone ______

Please cut out and send this form to Classified Department *Popular Computing Weekly,* 12-13 Little Newport Street London WC2R 3LD



SPECTRUM KOPYKAT

IMPROVED PERFORMANCE

Simply the best. Copying **any** program is now as easy as LOADing and SAVEing your own programs. **Any ZX Spectrum** program can be backed up onto a fresh tape. Even programs that cannot be stopped can now be copied. 100 per cent machine code. Copies headerless files. Prints file name. SPECTRUM KOPYKAT uses no program area so **full 48K** programs **over** 41.7K (9K for 16K machines) are easily copied. PLUS **FREE** Header Reader program. **Undeniable despatch by first class return of post**

Write cheque/PO for £4.95 to:

MEDSOFT

61 Ariston Road, Doncaster, DN2 6ER

IT CAN EVEN COPY ITSELF

THE KEY

THE ULTIMATE SPECTRUM BACK-UP COPIER

FREE HEADERLESS COPIER

THE KEY for any ZX Spectrum

ONLY £5.95 — IMMEDIATE DESPATCH (Europe — £6.25, Outside Europe — £7.50)

KEYSOFT DEPT PCK 2, 6 BRUCE GROVE, LONDON N17 6RA

SOFTSAVE for the Vic20 is a 100 per cent machine code utility program which allows you to back up most software onto a new tape. Cassette with instructions £4.95 from Softsave 248 Evelyn Street London SE8 5BZ.

SPECTRUM CHARACTER KIT 64 print prints 64 characters per line from your Basic program instead of 32. Master define gives all user definable graphics. Rotate reflect invert commands including. Two alternative character sets free. SAE for details. Both £4.50 each £2.90 cassette K. Ahmed 28 Magpie Hall Lane Bromley Kent

AUTOKOPY copies any type of Spectrum tape (16/48K) even programs full 16K or 48K long the best available machine code simple to use full guarantee £3 B Tidd 180 Hewlands Welwyn Garden City Herts

TELETEXT ON YOUR SPECTRUM. Create your own 800-page Teletext system with ZX text. Full colour graphics flashing 24 hour clock with alarm free sample system it's all here! Cassette £4.95 Iain Stewart 17 Torry Drive, Alva FK12 5NQ

SPECTRUM TRADE SECRETS. Explosive relevations including making programs unlistable unstoppable invisible how to reveal such programs plus hints/tips etc. Send £3 to ZX GUARANTEED (Ref TS) 29 Chadderton Drive Unsworth Bury Lancs

SPECTRUM 007 SPY Copies from £2. SAE details or send £3.95 for genuine Kopyall KopyKat plus machine-code program analyser ZX GUARANTEED (PCW2) 29 Chadderton Drive Unsworth Bury Lancs

SPECTRUM 48K Kopycat Copies any program including headerless up to 47.5K long Only £2.50 N J Osborn 74 Coombe Lane Westbury-on-Trym Bristol

HARDWARE

VIC20 OWNERS! Our Rampack adaptor allows standard software to be run on your expanded system without removing the Rampack. Simply switch your extra memory on or off as needed. Prevents wear to computer Rampack terminals £12.45 inc p&p L. W Staines & Co Unit 2 Roding Trading Estate London Road Barking Essex Tel 01-591 2900

POWER TO THE DRAGON! Hardware expansions for the Dragon, 16 line input/output port from £19.95. EPROM programmer (2716/2732 type) from £18.85. Send large SAE for further details to B Mistry 75 St Margaret's Road Bradford BD7 2BY

CONCHESS

ALL YOU EVER DREAMED OF FROM A CHESS COMPUTER AND MORE!

CONTEMPORARY CHESS COMPUTERS Ltd

FOR HIRE

FOR HIRE. Sinclair Spectrum available for only £2 per week. Plus free high-res computer game with every computer hired (London area only) Tel 459 0831 (after 6 pm)

SOFTWARE

DRAGON CRUNCHER

First cassette-based conversion program for Tandy Color programs to Dragon 32 and vice versa. Ideal for Rainbow readers. Only £7.95

ELKAN ELECTRONICS, FREEPOST
11 Bury New Road
Prestwich Manchester M25 8LZ
Tel 061-798 7613

"YOUR OWN SOFTWARE BUSINESS"

Start your own full/part time Home Based Software Business. Specially written Manual covers all you need to know including all Legal Practical aspects. Advertising Accounts Sign Writers Supplies etc etc. Order Now! Send £3.95 to T M B (PC) 1K Clifton Rd Prestwich Manchester

COM 64 SPRITES — Hard copy of data and picture of sprite. Program enables easy creation and modification of sprites. Screen display data and panel with printout option. Facilities include instant change of size sprite colour screen colour multi-colours £4.95 cassette T Hanson 2 Woodlake Gardens Muswell Hill London N10 3UA

DATABASE Very fast implementation in machine of small Database system. Maximum 260 entries 48K Spectrum £4.95 Alan Turnbull 65 Vicarage Road Stockport

SECOND-HAND ATARI software at low prices Adventures Preppie etc. Also your games bought SAE A. Horton 5 Ullswater Road Dewsbury West Yorks WF12 7PS

CLUBS

SPECTRUM OWNERS

Save time and money by joining our fantastic software club. Hundreds of pounds worth of games + books. **No rental charges.** All you pay as a member is a small handling charge. Sounds too good to be true? Find out what you're missing. Send SAE now to Microsoft-ware Club 73 Alcester Road Moseley Birmingham for details

SOFTWARE CITY SOFTWARE CLUB

Massive list of games tapes and discount card

For Spectrum Dragon 32 Vic20 BBC Sharp Apple

TRY BEFORE YOU BUY
SAE FOR LIST

16 THEOBALD STREET
BOREHAMWOOD, HERTS

SOFTWARE EXCHANGE Swap your used software via our club. Free membership £1 per swap. Most computers. SAE for details UKSEC 15 Tunwell Greave Sheffield S5 9GB

SWAPSHOP swap your BBC Spectrum and Texas programs. Membership free. Membership and/or details from M A Paris (Swapshop) 38 Wooburn Manor Park, Wooburn Green High Wycombe Bucks

EDUCATIONAL SOFTWARE

*** PARENT? TEACHER? ***

LERM announce EDUCATION ONE and MARKS BOOK for SPECTRUM. Written by highly experienced teacher both with MONEY BACK GUARANTEE. SAE for full details. EDUCATION ONE — 3 programs: Number Game, Spelling Game and Co-ordinates. All for £4.99. MARKS BOOK (basic + machine code — truly amazing) only £4.95 for 48K only

******** LERM ********

Dept W, 16 Stonepit Rdde, Cottingham, Market Harborough, Leicester

ACCESSORIES

DO YOU USE COMPUTER STATIONERY? Then don't buy more than you need. We will provide as little or as much as you require. Listing paper labels etc etc HCL, 19 Greenland Road Kemsing Sevenoaks Kent. Tel Otford 2916

FLOPPIES, cassettes paper ribbons labels ICs one etc. SAE for prices Dept MO MMS 28 Poplar Road Cleethorpes DN35 8BQ

DEALERS

SOFT MACHINE

A selection of the very best Software Books and Accessories available for ZX81 Spectrum BBC Dragon Vic20 and Commodore 64 Microcomputers

3 Station Crescent
Westcombe Park
London SE3
Tel 01 305 0521

or send SAE for free catalogue (state which computer)

CARVELLS OF RUGBY LTD

3/7 BANK STREET RUGBY
Tel 0788-65275

Vic20 Starter Pack Computer and C2N Tape unit. Intro to Basic Pt1 and 4 games. Only **£134**, usually £139.95

Atari 800 + software £290 48K Ram + Basic — plus the best of the US software in stock.

We also stock BBC B Electron CBM 64 Spectrum and software books. Phone or visit soon!

COMMODORE 64

£199 (excl VAT)

64 Programmers Ref Manual £9.95 + £1.50 p&p

Tel: Chris Gurney Dave Walsh or Floyd Patterson

Tel: 01 898 4004/7127 or send SAE
Image Business Micro Computers Ltd
189 Preston Road, London W1E 6TH
as cheques PO (add 15% VAT) and £8 for p&p Securicor delivery

Prices Frame 4380000 (a) for latest software site hardware information and prices. Full after-sales maintenance on all Commodore Equipment bought from us

ROCHESTER SOFTWARE AND COMPUTER CENTRE

38 Delce Road
Rochester
Kent

OPENING
12 September 1983

TEL 0634 409 305

FOR ALL COMPUTERS, SOFTWARE AND PERIPHERALS

LANCASHIRE MICROS

ACORN/BBC SINCLAIR COMMODORE DRAGON + LYNX PERSONAL COMPUTERS

We have a very wide range of software books and accessories. Including over 200 items for the Spectrum alone. Send for our list of software to

51 QUEEN STREET
MORECAMBE
Tel. 411630

A RETAILER for Number accessories in the North of England. We are situated near the M1 and M62 motorways. As well as a complete range of hard and software our service department can repair modify or fit a wide range of accessories. Hours of business 10 am — 6 pm Tuesday to Saturday inclusive

TELEPHONE PHILIP COPLEY ON 0924 272545
8 WESTLEY ST. OSSETT W YORKS

PLEASE RING FOR DETAILS OF OUR MAIL ORDER SERVICE

SERVICES

FREE ZX81 LISTINGS SAE Nick Godwin 4 Hurkur Crescent Eyemouth Berwickshire TD14 5AP



BBC LISTINGS, send cassette large SAE 25p per copy Mr S Pilzels Great Colemans London Road Ongar Essex

TAKE THE HEADACHE out of the programming Your listings for any Spectrum Vic20 Texas, saved on quality tape SAE 188 Brookleamead Harlow Essex with details

JONEL INDUSTRIES — computer and electronic repairs Sinclair specialist Send SAE to 25 Milford Chest Marshalswick St Albans Herts AL4 GPQ

MAGAZINES

DRAGON USER

To make the most of your Dragon you need Dragon User — the independent magazine for Dragon owners To make sure that you receive a copy of Dragon User regularly subscribe direct to us. A year's subscription costs £8 for 12 issues or subscribe for two years for £14 .40 and receive a free copy of either **Working Dragon** or **Dragon Gamesmaster** (overseas rates available on application) Send a cheque or postal order made payable to Dragon User and accompanied by your name and address to Dragon User Subscriptions Department Oakfield House Perrymount Road Haywards Heath Sussex RH16 3DH

WANTED

WANTED

Quality Games and utility programs for any Micro All programs considered *Instant cash plus royalties on all programs accepted with a view to distribution in UK USA and Europe*

Baum Software PO Box 54 Basingstoke Hants RG21 24B Tel Basingstoke (0256) 25107

SUNSHINE

is seeking authors for new titles to add to its large original and successful book range Experienced and first time authors are invited to submit manuscripts, ideas or letters of interest For details of what we can offer from **David Lawrence, Book Editor Sunshine 12 13 Little Newport Street, London WC2R 3LD**

Sunshine Publishers of Popular Computing and Dragon User

WANTED. D Clutter by PBS Jacques 47 Newstead Road Urmston Manchester

DRAGON M/C CODE. Programmes urgently required Phone 0382 88232/ 80546

URGENT

We urgently require for a nationwide retailer quality machine-code Arcade games for Vic20 and Spectrum machines.

Best prices paid for the right programs

RAINBOW RESEARCH
HIGH STREET
PONDERS END ENFIELD MIDDX

TO HIRE A COMPUTER from ZX81 upwards, ring or write to Business and Computer Services 292 Caledonian Road London N1 1BA. Tel 01-607 0157

WANTED. ZX81 and accessories Basildon area Basildon 557455

WANTED BBC B in good condition Tel 01 852 0434

WE ARE INTERESTED in supplies of hardware software literature for Scandinavian market Replies to RDB Marketing Box 15024 161 15 Bromma, Sweden

RECRUITMENT

PHOENIX SOFTWARE

Are looking for Machine-Code Arcade-quality games We have an idea which could make your game the best seller in Europe

Send your program to

PHOENIX SOFTWARE
Spangles House
116 Marsh Road
Pinner, Middx
or Tel

01-868 3353

NOW!!!

16K ZX81 + Fuller keyboard 17 multi games tapes leads manuals magazines Tel Crowborough 63373, evenings

BARGAIN MATTEL INTELLIVISION 20 cartridges including Chess Demon Attack Dungeon and Dragon's Lock n Chase £250 Tel 01-203 1104

SPECTRUM 16K, Raquel presents her games for age 18 and over only (State age when ordering) Still only £2 95 ! Bloods 17 Malvern Coleman Street, Southend Essex

TRS 80 LEVEL 2 30K Green monitor sound almost new recorder plus software £275 ono Tel 304 7784 evenings

ATARI 400. 48K 810 D D 410 recorder games Basic/assem books Accept £450 ono Tel Redhill 61612 evenings

BBC with disc interface £400 Spare 8271 £25 Silentype printer with Apple card £150 or offers Cannon 18 Cowslip Bank Basingbeas Hants

ZX81 16K COMPLETE. Books software included £39 Tel Birmingham 779 3096

VIC20 + C2N cassette unit + 16K Ram + Introduction to Basic Parts 1 and 2 + £80-worth of software + joystick, magazines and books only £190 ono Tel Barnsley 383584

6502 M/C PROGRAMMER

Commodore or BBC owner with experience in BASIC and 6502 M/C programming required for major new development Full-time preferred Competitive rates

Please apply to John Ruck Marshall Cavendish Ltd 58 Old Compton Street London W1V 5PA Tel 734 8710

FOR SALE

MZ80K (48K Ram) with reset switch 4MHz high speed board, separate video monitor output, plus MZ8010 unit. Very good condition £275 Tel 0400 73008

LYNX 48K, CPM compatibility high resolution graphics with manual and demo cassette as new £180 bargain Tel 591 5210

VIDEO GENIE COMPUTER 16K very good condition built in cassette TRS-80 compatible Typewriter keyboard with £250 software (arcade games utility education) magazines, £120 ono 01-578 3934

ARCADE MACHINE DISC £30 Defender 2048er £15 each Atari 400/ 32K including Basic manuals £100 Tel Paddock Wood 4240

VIC20 plus cassette joystick 20 games Four months guarantee £130 Tel Norwich 502002 evenings

LYNX 48K, three months old unwanted prize Introductory tape + games tape + instruction books £190 Tel 0484 39295

ATARI 400 48K, moving keyboard recorder books software basic, £190 0734 345119

SPECTRUM tape exchanges Exchange your unwanted Spectrum software for £1 each tape Send SAE for list, 34 Avendale Rbec Nelson Lancs BB9 0DA

PROGRAMMERS

SD SOFTWARE
Program Writers Co-operative
Hampland Cottage N Lopham
Diss Norfolk

★ PROGRAMMERS. Our Author Members not only receive 70% of income from their published software also there are many other benefits in joining us Send us a copy of your ideas work and tell us about yourself (Any Popular Micro) Copyrights fully respected

★ MICRO-OWNERS. We write and distribute good quality original software at sensible prices not expensive psychedelic packaging Why not send for our lists (Give details of your system)

Computer Swap 01-734 3454

Free readers entries to buy or sell a computer. Ring 01-734 3454 and give us the details.

Spectrums for sale

SPECTRUM software for sale Trader £7 50 Bowling Alley £2 50 H Horace £2 50 H Goes Skiing £2 50 The Hobbit £7 50 Penetrator £4 50 Originals Tel 0826 715138

FOR SALE Spectrum 48K (£70) and Pimania Flight Simulation Schizoids, Invaders Asteroids Assembler Chess Adventure C Offers Tel Gavin on Amersham 02403 7412

SPECTRUM AND TANDY SOFTWARE for sale Send sae for details Also RD Lab's digital tracer £30 J Jones, 47 Love Lane Denbigh Clwyd

SPECTRUM 48K. 9 months guarantee left 11 arcade plus other software and program recorder £136 Tel Ingrebourne 76431

SPECTRUM 80K Kempston joystick £75 of software including Zzoom Kong Tranz AM Bre rolls of printer paper one book 60 magazines £175 Tel Orpington 30784

COMPUTER SWAP

Computer Swap entries are limited to 30 words Either fill in the accompanying form and send it to Computer Swap *Popular Computing Weekly* 12-13 Little Newport Street, London WC2R 3LD or telephone 01-734 3454

All software offered through computer swap must be in original condition and for private sale only

Warning: It is illegal to advertise pirated software

COMPUTER SWAP

Please write your copy in capital letters on the bars below

Name ....

Address ....

....

Telephone ....

SPECTRUM 48K printer £150 of software tape recorder £230 ono or swap for CBM 64 or Dragon Bethesda (NW) 600997

SPECTRUM DKTronics keyboard £30 ono Tel 01-874 4221

SPECTRUM 48K, lots of software including Trader Penetrator Time Gate Manic Miner Flight Simulation Cookie, etc + Kempston joystick + bag of magazines worth over £300 manuals and leads included £200 ono Tel 051 727 7211 (Paul Huxham)

SPECTRUM 48K + £36 of software including Time Gate Penetrator Minedout £110 Tel Gosport 80071 (evenings)

SPECTRUM 16K, brand new + software and book £60 Tel 061 862 1834

SPECTRUM 48K + printer + 2 cassette games excellent condition only 2 months old £140 ono Tel Oxford 733801 after 6 pm

SPECTRUM, 16K, still guaranteed £60-worth of games many magazines only £90 must collect Tel 01 555 1387

ZX SPECTRUM 16K + Kempston joystick interface + much software + hardware Tel Alex Farndon 270061

SPECTRUM 48K, Quickshot joystick, £150 software Flight Simulator Jetpac Penetrator Combat Zone etc utilities ZX tool kit dissambler assembler £40 books worth £350 sell £210 Tel 01-213 7532 (office hours)

KEMPSTON pro joystick + interface hardly used £15 ono Tel 0802 268617

ORIC 48K virtually new + over £70 software £136 Tel Ruislip 73507

OK1 micro 80 + a video genie interface £200 Video Genie 3003 48K Ram sound many games utilities + 28 copies of Micro 804 £225 Tel Scarborough 863737

UK101 16K 14K fitted cased both with monitor programmable sound board software books etc £100 Tel Martyn Thomas work 0530 414444 home 0609 843412

SWAP my cannon A1 camera with electronic flash for Commodore 64 with Simon's Basic Tel 0702 523431

SWAP SPECTRUM 16K for Oric 16K or 48K Tel 01-690 5873

OVER 100 Spectrum games for sale inc The Hobbit, Penetrator Jetpac PSST Tintagels Flight Simulation etc List Tony Moran 23 Egerton Road South Chorlton Manchester M21 1YP

SPECTRUM software cassettes for sale inc The Hobbit Arcadia and many other big names approximately 20 cassettes worth £136 Any offers? Tel 01 574 4122.

SPECTRUM 48K + £130 software + £150 of books bargain at £175 the lot. Owner buying BBC Tel 0223 58722

SPECTRUM 48K 2 months old, still in box, + leads + over £100 software Manic Miner Kong + program + maps sales + manuals with lots of software £200 ono Tel Exeter 75439 (Jones)

SPECTRUM 48K books, software inc The Hobbit £90 Tel Abertillery (0495) 214977

SPECTRUM 48K, still under guarantee 2X printer + large collection of software £140 ono Tel Luton 54931

SPECTRUM 48K, with around £500 of software mainly games including well over 70 cassettes sell £250 ono Tel 574 4122

SPECTRUM GAMES to swap or sell over 50 titles including The Hobbit, Penetrator Manicminer Trantam Combat Zone ZZoom ZipZap Cookie Vetpac. Tel 448 6366 private sale

ZX SPECTRUM 48K, F D amplifier box of software £85 must collect Tel Alan on 01-300 2488 after 6 pm

SPECTRUM GAMES for sale all half price Ring for details 328 2075 after 5 pm Ask for Mike

SPECTRUM 48K 1-month-old tapes + magazines £190 ono Tel 061 733 0090 after 6 pm

SPECTRUM 48K 3-months-old + tape deck over £100 software 2 sets of manuals 3 programming books + a boxed amplifier worth £300 sell for £200 Tel Alan 021-476 3308 after 5 pm

SPECTRUM 48K + tape recorder + all leads + magazines and books £150 Tel St Albans 59022

SPECTRUM 48K + Kempston stick Sony recorder + ZX printer + 12 latest games (including Hobbit) + books as new £205 ono Tel Kirkpatrick Durham (055665) 340

ZX PRINTER + Flobbrunner game only £40 (Ask for A Kamalan between 5-7 pm) Tel 881 0340

ZX81s for sale

SWAP ZX PRINTER - spare power pack + three magazines for any Spectrum keyboard except Fuller keyboard sell for Kenlesh Tel 881 0340 5pm and 8 pm

FULLER KEYBOARD for Spectrum or ZX81 joystick £20 Tel Ian on Livingston (0506) 34497 (6 pm)

48K SPECTRUM More than 11 months guaranteed + tapes and magazines worth £240 offers £190 or swap for Electron or 64 Tel 051 733 0090 NB cannot collect

SPECTRUM + **32K,** fitted + sound amplifier worth £330 offer £200 Tel 885 1286

SPECTRUM SOFTWARE Lots of original software to sell at 75% of price and some software required at 50% of price Send lists to S Winter 26 Cree Grove Chalfont St Peter Gerrards Cross Bucks

SINCLAIR 16K Ram pack for ZX81 £15 Tel Bournemouth (0202) 429429

ZX81 16K 3 cassettes where worth £30 Tel 021 358 4730

ZDC 81, 16K plus £16-worth of software selling for only £20 all good condition Tel Stevenage 368813 after 7 pm

ZX81 16K Ram software included Volcanic Dungeon Star Trek Star Fighter Catacombs etc plus Peek Poke Byte & Ram books £40 the lot Tel Rugeley 6677

ZX81 16K + guarantee, leads, manuals games £50 Tel 021 326 0463

ZX81 16K with keyboard plus seven tapes eight months old £90 ono Tel Haywards Heath 415259

ZX81 16K. Manual still under guarantee Leads games still in good condition Football manager Mazogs Space Invaders £50 Tel 021-823 0463 any time after 4 pm

ZX81 16K, with 15 software cassettes leads and manuals boxed still under guarantee £45 ono Tel 0418 426630

ZX81 with Memotech 16KR plus £30 software plus opcode wall chart, £50 Tel 0802 200365

ZX81 16K Condition as good as new with box of the best software useful books and magazines software includes Monster leads 3D Defender mazogs, etc £10 ono Tel Neil Denham 832679 after 5 pm

Commodores for sale

VIC20 plus C2N plus 16K Ram pack four cartridges 3K Ram pack, £150 software two books bargain at £190 Tel Codsall 2188 (after 4 pm)

VIC20, cassette recorder 8K expansion 3K super expander Gorf cartridge + £30 of software joysticks + books/magazines £180 Tel Sunbury on Thames 88145

VIC20 C2N cassette unit 16K Ram joystick, £100 software cost £290 sell for £200 Tel 02302 3618

VIC20 £90 cassette unit, £25 16K Ram pack £35 3K Ram £15 Adventure cartridge £10 software + books at half price Tel 027562 2477 (after 5 pm)

SWAP VIC20 adventure cartridge Voodoo Castle for any other adventure cartridge or sell for £13 Tel Chorley (02572) 74832

VIC20 16K cartridge C2N cassette Jelly Monsters cartridge Programmers Reference Guide and Vic computing magazines nine pulse dust covers £200 Washington 4171510

SWAP VIC20 with cassette deck cartridge eight cassettes and book for Colecovision Console and cartridge Tel Clitheroe 26648

VIC20 + cassette deck + 16K cartridge + Adventure cartridge + joystick + dust covers + Intro Basic Part 1 and other books £140 Tel West Drayton 44486

VIC SUPER EXPANDER £20 four cartridges at £15 each one cartridge + joystick at £20 Tel Yeovil (0935) 823537

VIC20 + cassette unit, £90 ono Tel 01-363 8764

VIC20 + C2N cassette 32K memory expansion + Intro to Basic Part 1 + books programs games £125 Tel Ongar (Essex) 363947

VIC20 + cassette unit + super expander + machine code monitor + Vic Revealed + joystick + magazines £50 of software excellent condition boxed as new ideal for beginners £150 Tel (0483) 224189

VIC20 + super expander + C2N cassette deck + joystick + Backgammon Grid Runner Skramble worth £230 accept £120 ono Tel Epsom 26610

ARFON VIC20 EXPANSION UNIT 7 slots including leads 11 cartridges to swap for 1541 disc drive Tel 01 387 8761 (6 pm)

VIC20, C2N cassette unit, 2 joysticks 3+8K RP super expander over 100 cassette games over 18 cartridges, 7 books over 35 magazines Offers please telephone 01 205 0649

VIC20 Voodoo Castle Cartridge will swap for Omega Race also Alien for Cosmic Jailbreak or road race Tel 0222 881235

VIC20 STARTERS PACK, brand new 6 days old sell for £140 or swap for 48K Spectrum Tel 553 3571

VIC20 plus 16K memory 3K super expander motherboard 5 cartridge games including Choplifter 2 manuals £120 Tel 01-340 6623 (after 6 pm)

SWAP YOUR 64 FOR MY 64 I have a CBM 1701 monitor but AV socket is incompatible with mine Will give £85 software Tel 01 748 8178 any time

VIC20 CASSETTE DECK Telephone with offers 061-499 2001 after 4 30 pm

Acorns for sale

BBC SOFTWARE Killer Gorilla Chess Startrek Planetoids Snapper Polaris Monsters Arcadians Frogger Sphinx Castle Ricochet Swap for any interesting BBC programs Phone Dave Ilfracombe 66032 evenings

SWAP YOUR BBC MODEL B for a complete darkroom for colour and black and white photography worth well over £500 Please contact Biggin Hill 75047

BBC MODEL A. Brand new duplicate price £299 will sell for £250 Tel Reading 580417

ONLY £49 ONO Expanded Acorn Atom Bargain Tel 0532 742450 after 6 pm

ACORN ATOM, 12K Ram all leads and power supply £70 Tel 3114054 evenings only

VIneLAB CONTROL INTERFACE for BBC micro New with manuals £90 Tel (0344) 686174

BBC MODEL B Excellent condition £150 of latest quality software bargain as £300 Tel Staines 54228

BBC MODEL A + 32K all offers considered for this excellent package including monitor cassette recorder software nodes etc, all as new worth £560 Tel John for details on Kidlington 6880 evenings

ACORNSOFT S Planetoid Monsters, Doctor Soft Flight Simulation Superior Software's Fruit Machine All originals swap for similar quality software Tel 090484 (York) 271

BBC B April 1983 (1.2 mos) boxed all leads approximately £50 worth of tapes + loads of magazines all for £375 ono Tel 01-689 0622

Dragons for sale

DRAGON 32, still under guarantee perfect condition two cartridges software and joystick cost over £250 will take best offer over £150 Tel 01 942 5020 after 6 pm.

DRAGON 32 + joysticks + over £100 worth of software including Dasm Assembler cartridge + two books £210 ono Tel 574 9504

DRAGON 32, excellent condition + £60 worth software £150 Tel Rustington (09062) 72845

DRAGON FANS interested in starting Dragon Club in Ware area Tel Ware 68264

DRAGON 32 + cassette only three months old nine months guarantee + two games + book (games) etc £150 ono Tel 654 2324 (after 6 pm)

DRAGON 32, boxed five months guarantee over £70 software including Donkey King Shuttle Katerpillar etc joysticks Dustcover books and magazines etc offers over £170 Tel Co Durham (0388) 814717

DRAGON MACE EDITOR/ASSEMBLER PACKAGE + assembly language programming and ats 4809 (Leventhal) £35 or swap for sound extension module Tel 0482 634283

DRAGON 32 SOFTWARE. DACC Flight Simulator Drone Quark MRC Fruit, Tyrant of Athena Stockmarket, Submarine Command All original condition £5 each Tel Richard Hill 01-953 9101 after 8 pm

UNUSED DRAGON 32 tape recorder joystick, machine book 30 program book, cassettes Donkey King Shuttle Planet Invasion, Black Sanctum Defense and others worth over £290 will accept £225 Tel Littlewick Green 2516

DRAGON MOUNTAIN, Nightflight (Salamander) £8 both or swap for other Dragon software Tel 061-682 5024 after 7 pm

DRAGON 32, joystick plus £240 software books magazines listings boxed titles include Shuttle King Bonka Android 35 in all Buyer collects only £225 Tel Russell Southend 0702 73740 evenings

DRAGON software for sale or swap Black Spectrum Ultimate adventure 4 Startrek, all three for £10 or will sell separately Contact 0324 81 2061 after 6 pm

DRAGON 32 + joysticks + dust cover + £120 worth of top name software including King Gridrunner Androet Champions Pimania + six books £170 no offers Tel 0342 27072

DRAGON OWNERS. Ring of Darkness £8 + Space Trek £4 both original cassettes £10 for both Tel 061 766 4770 (after 5 pm)

DRAGON 32 boxed fully working plus brand new joysticks and cables and small amount software £150 ono Bracknell (0344) 29613

FOR SALE, Dragon 32 software Cosmic Zap Galactic Ambush Talking Android Attack £6 each Missile Command £5 All original Arcade games Phone Robert on (0444) 413687 evenings

DRAGON 32 and joystick £140 ono Tel 01 555 9903

DRAGON 32 + joysticks + £60 worth of software books + magazines swap for BBC or £160 Tel Fleetwood 79249

DRAGON 32 six months old + compatable recorder + software worth £300+ joysticks + high res cartridge swap for Atari 400 48K with Basic + recorder or BBC Micro Tel 061-652 1012 (after 5.30 pm)

DRAGON 32, good condition, over £100 of software two joysticks cassette recorder books + magazines light pen £220 Tel 01 794 7079

Ataris for sale

ATARI 400 SOFTWARE Adventures 4 5 8 9 12 £8 each Defender £15 Rajabuggies, £12 Ghost Hunter £8 Airstrike £10 Appleoanic £13 Preppie £11 Shamus £13 Astrochase £13 Centipede £13 Star Raiders £14 + others Tel Sunbury 49149 evenings

ATARI 400 16K, 410 program recorder Basic, £150 software including Donkey Kong joysticks manuals £250 swap for 48K Spectrum + software or Commodore 64 + software or recorder sale Philips G7000 TV game + five cartridges Tel Hesketh Bank (077 473) 4962

ATARI 400 DEFENDER CARTRIDGE, swap for Star Raiders cartridge or claim Jumpers + £5 Tel Northwood 22559

AT400 + Pitfall Combat, Space Invaders, joystick, Missile Command six months old paid £160 except £100 or 48K Spectrum Tel 01 267 0620

TWO MONTH OLD ATARI 800 48K plus manuals + joystick, £285 Tel 01-860 7749

ATARI VCS with controls + 10 good games including Pacman Space Invaders International Soccer Missile Command worth £260 will accept £125 Tel 734 2687 daytime 866 2145 after 4 pm

ATARI 800 16K + new recorder £80 software + books £230 Tel 01-736 3889

ATARI 400, + manuals Basic language cassette unit, two joysticks £145 Tel Birmingham 458 1563

ATARI computer software Necromancer 32K £18 seasbility experiment 16K (text adv) £900 Tel Dave, Nottingham 0602 580015

ATARI 800 new complete with 410 data recorder and three games, Missile Zarrox, Preppie and some books £260 Gravesend 64806

TWO MONTH OLD ATARI 400 48K, manuals joystick £285 Tel 01 860 7749

ATARI 400/800 original software assembler/editor Rom graphic, generator + graphic master discs Microsoft Basic etc mint condition offers to Tel 0702 201437

ATARI 400 16K + joysticks + software + Basic + cassette recorder swap for 48K Oric + £20 Tel 01 499 8136

ATARI 800 Basic, recorder joystick game cartridge cassettes four books 10+ magazines (Analog Computel Page 6") worth £250 sell for £160 or swap + £150 for BBC B 1.2 O S Leeds (0532) 74488

ATARI 400 48K 4 1 0 tape recorder + 8 10 disk drive + lots of software including Zaxxon, Shamus etc + joysticks whole lot £400 ono or will sell separately Tel 01 571 2670 after 4 pm.

ATARI 400 16K, program recorder Basic cartridge program kit energy Czar cassette £140 Tel 01 743 3748 evenings

ATARI VCS CARTRIDGES for sale Asteroids, Pac man Yars Revenge Star Raiders Defender Space Invaders £15 each Stampede Street Racer £10 each Phone Buckley (0244) 542420 between 5 pm and 9 pm

DRAGON 32 plus two joysticks plus software eg Salamander Dragon Trek, Microdeal Space War and Cable Software Drone Datatank for £150 Phone Rankridge (Staffordshire) 3057

DRAGON 32 cassette recorder joystick software books and magazines excellent condition six months old £140 Tel (602) 607 822

Tandys for sale

TANDY MODEL ONE 48K expansion interface + disc drive manuals + some software £350 Tel 061 748 0705

TANDY TRS 80, 16K, model 1 level 11 Quick printer various manuals + books £150+ software two games offers around £200 Tel 0632 20988 (office)

VIDEO GENIE, eg 3008 integral cassette lower case mod and expanded to 48K + double density controller for disc drive manuals books + software £250 ono Tel Ashbourne 70645

TRS 80, pocket computer + cassette interface 12 months old £40 ono Tel Aldershot 317844

TANDY TRS 80 model 1 level 1 16K with VDU cassette recorder software + manuals bargain at £130 ono Tel Harlow 0279 412242

For sale

SWAP EARLY WARNING CASSETTE for the BBC for any Spectrum game Tel 0245 84583

INTELLIVISION GAMES computer £50 plus several games half price Tel 0706 225677

TEXAS TI99/4A 16K, eight months old cassette leads two manuals plus program book space Invader module and 10 tapes. Hardly used £110 ono Tel Stephanie 0273 731489

VIDEO GENIE, 16K including cassette + counter complete with handbooks leads printer interface + upper/lower case chip £100 Tel 01-892 1487

20K COLOUR TV plus two games, £128 ono Tel 0632 742052 after 8 pm

SWAP GRANDSTAND SCRAMBLE for any two 16K ZX81 games by Artic or Quicksilva. Tel (061) 436 5198 Manchester

SWAP ATARI 400 defender cartridge for Gorf Dig-Dug Miner 20-49er Quix or Zaxxon Tel Northwood 22559 after 5 pm (private sale)

LEVEL 1 SOFTWARE plus manual Offers Tel 021 7421446 before 10 am or after 6 pm

32K PET + Pick Chip including invoice control stock control customer file multi-column data base + 50 games excellent condition £300 Tel 01-992 9246

TEXAS TI99/4A, as new with joysticks cassette interface lead Beginners Basic tutor tape, one games module. Less than three months old with nine months guarantee £120 Tel Jim Bournemouth 518928

SPECTRUM software originals worth £518 sell for £195 Tel 0245 64583 (private sale)

SENSORY NO 9 for sale mint condition cost £165 sell for £125 Tel 0302 721458 (after 5 pm only)

JUPITER ACE COMPUTER + leads manual software £60 Tel 0254 76228

FOR SALE, Mattel Intellivision excellent condition plus seven cartridges £170 W J Martin 5 Cage End Close Hatfield Fenoad Oak, Essex

VIC20 8K excel storeboard cassette unit, joystick Vickit 3-hi resolution software includes Matrix, Crazy Kong Spiders Startreck etc £160 01-300 3110

DRAGON 32 + joysticks + software + books + cassette player (worth over £400) £256 Tel 0946 20419

FOR SALE Atari VCS with 30 cartridges £400 Tel Simon 01-400 3532 from 4 pm to 8 pm

ATARI 800 (48K) disc drive cassette sticks software six months warranty left, genuine sale £800 ono Nottingham 275925

SWAP TECHTRONIX Selartron Oscilloscopes for BBC MX80K or Spectrum Tel 0753 883031

Wanted

WANTED ZX81, 1K Ram leads power supply and manual £15-£20 Write to C Serafim Hormebiloo 129 Pireas GR-185 44 Greece

WANTED TI-99/4A original cassette software Also for sale Spectrum software Tel Hornchurch 57487

VIC20 CASSETTE UNIT WANTED, also Vic Cartridges wanted. Tel Saddleworth 2518 (Oldham)

WANTED C64 1541 DISK DRIVE (as new condition + manual etc) for my MZ-80K (integral cassette + monitor) + software All good condition or sell £250 ono Tel Cardiff (0222) 732955

SPECTRUM SOFTWARE I will buy certain original software titles for 50 per cent price Also software to sell at 75 per cent price Send list of programs for sale/wanted to S Winter 25 Cries Grove Chalfont St Peter Bucks

WANTED BBC MICRO MODEL B in working order Tel Durham (0385) 67254 (evenings/weekend)

WANTED VIC20 cassette software (only latest) Also Audiographics cartridges Tel 01 574 4122

48K COMPUTER + SOFTWARE (Spectrum preferred) Reasonable price Tel 01-628 5004

WANTED PAIR OF VIC20 or Atari paddles swap for lots of good Vic20 software Tel 0384-57360 (ask for Charles)

WANTED BOOK BYTE and Another Vic in the Wall Tel Kidsgrove (Stoke-on-Trent) 3716 2640

WANTED JUPITER ACE with manual Tel Bradford (0274) 728984 (office hours)

WANTED 1541 DISC DRIVE, will give 7 slot micro expansion unit + 11 cartridges and £100 worth of games. Tel 01 367 8751 (evenings only)

WANTED ATARI 800 Will pay up to £200 or Dragon 32 will pay up to £130 Tel Ingrebourne 76431

WANTED 8K AND 16K RAM PACKS for Vic20 also ZX printer with interface Tel 01 367 8751

WANTED 48K Spectrum plus software plus preferably printer in exchange for 48K Lynx, with £20 worth software Tel Steve 0788 22207 after 5 pm.

VIC SOFTWARE to swap for Vic20 joystick and Chopper game Tel Darlington 463151

WANTED 48K SPECTRUM. Swap for Vic20 16K Ram pack cassette player plus over £100-worth of software joysticks and more or sell for £175 Tel 987 7976

WANTED BBC MODEL B in good condition or upgraded Model A with or without software Tel 01 560 4001

WANTED Secondhand Spectrum 48K Tel 808 4206

STARSHIP



Starfighter sounds like a cross between *Star Trek* and *Time Gate* You must pilot your intergalactic starship through the nine sectors of the galaxy, destroying the aliens who have infiltrated starfleet's bases

The game features scanners which will locate the enemy forces, whereupon they can be obliterated by your photons and phasors

Interstellar travel is accomplished via star gates which you must locate and pass through Naturally, the aliens are not likely to take all this lying down — they defend themselves with mines which they scatter around your ship

Aside from simply blowing up aliens you will have to refuel from time to time and replenish your energy which is drained in battle

Program *Starfighter*
Price *£6 95*
Micro *Oric 48K*
Supplier *Martech*
9 Billingburgh Road
Eastbourne
E Sussex BN20 8LY

GALAXY

Workforce is one of those companies that has not deserted the ZX81 despite offering programs for the Spectrum

Although Spectrum programs often look cheap compared with, for example, BBC programs conversely ZX81 programs are beginning to look equally good value in comparison with the Spectrum

For £4 50 Workforce is offering two machine code games on one tape *3D Space Battle* comes with *Moonlander* The latter needs no introduction except to say that this version features two stages of resolution and smooth graphics

3D Space Battle displays the galaxy before you Moving in any of eight directions, you must fight and dodge approaching aliens

Program *3D Space Battle/Moonlander*
Price *£4 50*
Micro *ZX81 (16K)*
Supplier *Workforce*
140 Wisden Avenue
Luton
Beds

IQ PROBLEMS

One of the many tasks computers are good at is setting and marking tests They are horribly thorough and incorruptible and never give you the benefit of the doubt

The *Tiger IQ Test* produces a high resolution display and uses up the entire memory of the 32K Dragon

The tests are included in the cassette — both are mixtures of various kinds of IQ problems testing language, and other skills

Program *The Tiger IQ Test*
Price *£7 95*
Micro *Dragon 32*
Supplier *Tiger Software*
63 Devonshire Street
Monkwearmouth
Sunderland
Tyne and Wear

IN ORBIT

Microdeal has made a tentative step away from its exclusively Dragon based range with two new releases for the BBC B — *Air Traffic Controller* and *Shuttle*

Shuttle takes the concept of a flight simulation program one stage further, as you use your instruments to pilot your shuttle into orbit Once up, the next task is to find and recover a satellite and come back down again

The BBC program is based on the Dragon version but with improved graphics — release date is October 1

Program *Shuttle*
Price *£8*
Micro *BBC B*
Supplier *Microdeal*
41 Truro Road
St Austell
Cornwall
PL25 5JE

HEADS

The *I Ching* or *Book of Changes* is a means of predicting the future and/or revealing insights about the world based on whether three coins come up heads or tails

Clever mathematical type people realised that the *I Ching* used an elaborate binary system and Carl Jung, among others thought that, for whatever reasons it seemed to work Now you can throw the *I Ching* on your Dragon 32

Although it is simple enough to mimic the random fall of coins on a computer this program actually includes text as well Since the original book is over 600 pages long, I suspect this is going to be a highly condensed version

Program *I Ching*
Price *£6 95*
Micro *Dragon 32*
Supplier *Virgin Games*
61-63 Portobello Road
London W11 3DD

RANDOM

One of the most original ideas I've seen for a while is *Splat* — an arcade style game for the 48K Spectrum

You must move around a maze eating fruits and grass, surviving long enough to get to the next level Wait a minute there's something wrong here that doesn't sound very original

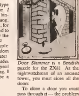
Oh yes! I forgot to mention the whole maze is moving randomly and your task is to avoid getting smashed against the four outer walls or else well, *Splat*

The program is written by Ian Andrew and Ian Morgon — the former wrote the popular *Mined Out* for Quicksilva

There is supposedly an exit from the maze at level seven, but the makers are fairly confident no one is going to get that far — not for a while anyway There is a prize of £500 for the highest score

Program *Splat*
Price *£5 50*
Micro *Spectrum 48k*
Supplier *Incentive Software*
54 London Street
Reading RG1 4SQ

TOWER GHOST



Door Slammer is a fiendish puzzle for the ZX81 As the nightwatchman of an ancient tower, you must close all the doors

To close a door you must pass through it — the problem is, if you do not plan it exactly right, you may find yourself locked in the tower with nothing but the tower ghost for company

On the same tape, as a sort of free gift, comes a utility called *Flash* which will enable you to invert and flash the screen — you are actually encouraged to list it and use it in your own programs

Program *Door Slammer/Flash*
Price *£4 95*
Micro *ZX81 (16K)*
Supplier *Cathedral Software*
The Lodge
Brandon Lane
Brandon
Co Durham
DH7 8SJ

NEW RELEASES

LIGHT BIKE



Light Cycle will need no introduction to anyone who saw *Tron* Personal Software Services originally issued the program on the Spectrum but have now converted it to the Oric

The aim of the game is to guide your light bike around the screen without crashing into the sides, the computer's own bike(s), or the wall that is gradually created as you power across the screen Since the computer is trying to trap you, this is often very difficult

Program *Light Cycle*
Price *£6 95*
Micro *Oric 1*
Supplier *PSS 452*
452 Stoney
Stanton Road
Coventry

RESOURCES

The big problem with putting your Spectrum to serious uses has always been access time to the program — you can hardly have a quick check of your bank balance if the program takes seven minutes to *Load*

With luck though, it could all change with the Microdrive *Loading* vast chunks of program and data in second — provided of course, that Sinclair can get their quality control act together

Still, it looks like serious packages could soon come into their own and astute companies will make sure that their programs can easily be customised for *Loading* and *Saving* with the Microdrive

Bank Account System by K Gouldstone allows you to keep track of your dwindling resources, labelling all transactions and setting up standing orders

Other options allow part of the records to be displayed for reference and alterations to be made

Program *Bank Account System*
Price *£4 00*
Micro *Spectrum 48K*
Supplier *K Gouldstone*
45 Burleigh Avenue
Wallington
Surrey SM6 7JG



STAR GAZER

More and more people are looking for serious uses for their micros, having got bored with playing games

One direction is the "home office" with the micro being a word processor, filing system, calculator etc

But, I think I see another strand Many hobbies could benefit from the introduction of computers, even at an amateur level — one of the most obvious, since it requires relatively little additional equipment, is astronomy

Bridge Software may therefore be on to a winner with *The Night Sky* This program turns your micro into a mini planetarium — 700 stars are featured with five magnitudes and 50 constellations

You input the month, date and time, and the various parts of the sky are displayed on the screen You can learn to recognise the major features of the constellations and chart their progress across the sky

Program *The Night Sky*
Price *£8 90*
Micro *Spectrum 16/48K*
Supplier *Bridge Software*
36 Fernwood
Marple Bridge
Stockport
Cheshire SK6 5BE

UNICORN

Keys of the Wizard is the latest adventure game from Microdeal Although text only it looks more sophisticated than most of its competitors

The program has a vocabulary of 30 verbs with nine monsters and nine different kinds of weapons Your task is to find 32 treasures scattered about the adventure and deposit them in the mysterious Sanctuary

To aid you in your quest, you may be visited from time to time by a unicorn who can sometimes be persuaded to give you a clue The monsters though nasty, can be defeated

Three levels of play are available depending, amongst other things, on how many hours you are planning to devote to it Should you start to crack with the strain, or be called for tea, you can save the game on tape

Program *Keys of the Wizard*
Price *£8 00*
Micro *Dragon 32*
Supplier *Microdeal*
41 Truro Road
St Austell
Cornwall PL25

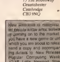
JAMMED

Dodg'em is a new arcade style game for the BBC B (or expanded A) As you might expect, you have to control your stock car as it hurtles round a track

The computer controls up to three robot cars, which will try to push you off the track by jamming your path

There are 15 levels of play so that even if you are a driving incompetent (like me), you might manage to survive

Program *Dodg'em*
Price *£5 95*
Micro *BBC B (expanded A)*
Supplier *Microgame Simulations*
73 The Broadway
Grantchester
Cambridge
CB3 9NQ



New Releases is designed to let people know what software is coming on to the market If you have a new game or utility which you are about to release send a copy and accompanying details to New Releases, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD

Ziggurat



Mental exercises

As the whole world knows, logic is very important. And to be educated in a manner which encourages one to be logical is of great benefit.

In 1894 Lewis Carroll wrote a letter to Mary Brown in which he said of logic: "I believe it's one of the best mental exercises that the young could have, and it doesn't need special powers like mathematics."

This is very true, and many of the new initiatives in teaching (such as the use of Logo) aim to help to improve the learner's logical skills.

On reading *Teaching and Learning With Computers* by Tim O'Shea and John Self (Harvester Press, 1983), I was very taken with their attempt to give a logical structure to their basic argument. They argue that artificial intelligence is very important in examining the place of computers in education.

One reason I was so interested, apart from the use of logic, was that I remain unconvinced of the usefulness of much work in artificial intelligence. O'Shea and Self start with four propositions, of which the first two are that computers will be widely used in education, and that most present programs are unsatisfactory.

There is not much we can deduce from those two. There is no common ground to the two propositions. The first uses "computers ... used in education" and "the future" as its key concepts. The second "programs ... unsatisfactory" and "now".

The two propositions have nothing to say to each other; they talk of different things and of different times. We need to add extra information to the discussion, such as "computers will use supplied programs" and "the future will be very like the present" or "the future will not be like the present" (take your choice).

As most present programs are unsatisfactory, will future programs also be unsatisfactory? Will the way computers are used in education change in the future? Questions such as these have to be answered.

O'Shea and Self offer a third proposition that the main reason for programs being unsatisfactory is that they lack knowledge of various kinds.

One can say little about this, other than that it is not true.

Most of the problems with present programs (do they mean educational programs alone?) are due to poor program writing and lack of imagination in their conception. Both these problems might be remedied if writers were more intelligent about their craft.

Even if the proposition is true, what can one conclude? Most present programs are unsatisfactory because they lack knowledge of various kinds? What has this to do with the future?

And so to the last proposition that artificial intelligence (AI) is concerned with making explicit the kind of knowledge that is lacking in program design.

Where does that get us? Most present programs are unsatisfactory because they lack knowledge of certain kinds, and AI is concerned with making explicit the kinds of knowledge needed for programs?

There is really nothing else we can say — unless we add many other propositions, such as a guess that workers in AI want to sell their expertise.

Anyway, from the four propositions O'Shea and Self conclude that the designers of computer systems to be used in education should take account of the subject of artificial intelligence and the users of such systems may expect them soon to provide facilities considerably more sophisticated than those available today.

Am I alone in wondering from where the premises for that conclusion came? I cannot see how the conclusion can be logically deduced from the propositions.

That the argument of self justification has been dressed in logical garb does not add any kudos in my eyes. In fact, as the rules of logical argument have so clearly been flaunted, one wonders about the rest of the book.

Given the above sequence of non-reasoning, a certain piquance is added to their later assertion that "... the emphasis in artificial intelligence on symbolic processing acknowledges that each of us thinks and lives within our own individual representation".

Nuff said. ■

Boris Allen

Puzzle

Fishing for twins

Puzzle No 76

The village of Muddlecombe can boast no less than five sets of twins. At a recent fishing competition, in which these twins took part, Lynne, Bertram, Charles, Donald, Eric, Julie, Gus, Liz, Isambard and Jill caught, respectively, 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10 fish.

Now, the Robinson twins caught seventeen fish between them, the Smiths caught sixteen, the Taylors caught nine, the Unwins caught seven and the Venn Wilkinsons caught six.

Can you match the twins, and give their surnames?

Solution to Puzzle No 71

We want to find three pairs of numbers such that the sum of the squares of the two numbers in each pair is the same value. If we arrange the six numbers (call them *A* to *F*) in numerical order, *A* being the highest and *F* the lowest, then we can see that *A* must be paired with *F*, *B* with *E* and *C* with *D* (*C* and *D* may be equal).

In the program, *C* and *D* are assessed. The value of *C* is decremented to give *B* and its complement, *E*, is found by subtracting B^2 from $C^2 + D^2$ and finding the square root of this number. If this is an integer the program proceeds in a similar way to find *A* and *F*.

```
10 LET D = 4 20 FOR C = 3 TO D 30 LET X =
C*C+D*D 40 FOR B = 2 TO C - 1 50 LET E = VAL
STR$ (SQR(X - B*B)) 60 IF E - INT E < > 0 THEN
GOTO 130 70 FOR A = 1 TO B - 1 80 LET F = VAL
STR$ (SQR(X - A*A)) 90 IF F - INT F < > 0 THEN
GOTO 120 100 PRINT A, B, C, D, E, F 110 STOP 120
NEXT A 130 NEXT B 140 NEXT C 150 LET D = D + 1
160 GOTO 20
```

This gives the answer

$325 = 18^2 + 1^2 = 17^2 + 6^2 = 15^2 + 10^2$

Winner of Puzzle No 71

The winner is Ray Rushton, Richmond Street, Keighley, West Yorkshire, who receives £10.

Top 10

Spectrum

1	(1)	Jet Pac	(Ultimate)
2	(3)	Scrabble	(Psion)*
3	(4)	The Hobbit	(Melbourne House)
4	(8)	Flight Simulation	(Psion)*
5	(2)	Tranz Am	(Ultimate)
6	(5)	Horace and the Spiders	(Psion/Melbourne House)
7	(4)	3d Tank	(DK Tronics)
8	(7)	Ah Diddums	(Imagine)
9	(16)	Cookie	(Ultimate)
10	(—)	Horace Goes Skiing	(Psion/Melbourne House)

*Requires 48K.
(Figures compiled by WH Smith and Son London)

BBC*

1	(2)	White Knight	(BBC Soft)
2	(—)	3D Bomb Alley	(Software Invasion)
3	(5)	Starship Command	(Acornsoft)
4	(—)	Record Keeper	(BBC Soft)
5	(4)	Alien Swirl	(Program Power)
6	(10)	Great Britain Limited	(Simon W Hessel)
7	(—)	Super Golf	(Squirrel Software)
8	(—)	Swarm	(Computer Concepts)
9	(1)	Hopper	(Acornsoft)
10	(—)	Demon Demonstrator	(Program Power)

(Figures compiled by Micro Management Ipswich 0473 59181)

ZX81*

1	(1)	Flight Simulator	(Psion)
2	(2)	Football Manager	(Addictive Games)
3	(3)	Space Raiders	(Psion)
4	(6)	Ship of Doom	(Artic)
5	(4)	QS Scramble	(Quicksilva)
6	(9)	Asteroids	(Quicksilva)
7	(—)	Chess	
8	(10)	Espionage Island	(Artic)
9	(7)	Defender	(Quicksilva)
10	(—)	Invaders	(Quicksilva)

*All run in 16K.
(Figures compiled by Boots & Co London)

Dragon

1	(2)	Frogger	(Microdeal)
2	(1)	The King	(Microdeal)
3	(—)	Shuttle	(Microdeal)
4	(3)	Talking Android Attack	(Microdeal)
5	(5)	Space War	(Microdeal)
6	(6)	Ring of Darkness	(Wintersoft)
7	(4)	Night Flight	(Salamander)
8	(—)	Grid Runner	(Salamander)
9	(9)	Monaco Grand Prix	(Microdeal)
10	(7)	Dragon Trek	(Wintersoft)

(Figures compiled by Boots & Co London)

Atari

1	(8)	Miner 2049er	(Big Five)
2	(—)	Hellcat Ace	(Microprose)†
3	(—)	Mountain King	(CBS)
4	(—)	Orc Attack	(Thorn EMI)
5	(1)	Ultima II	(Sierra On-line)‡
6	(2)	Pond In Danger	(Avalon Hill)‡
7	(—)	Pooyan	(Datasoft)†§
8	(—)	Combat Leader	(SSI)†‡
9	(9)	Arcade Machine	(Broderbund)‡
10	(—)	Deadline	(Infocom)‡

*Cartridge †32K cassette ¶48K cassette §32K disc ‡48K disc.
(Figures compiled by Calisto Computers Birmingham 021 632 6458)

Books

1	(1)	Structured Programming with BBC Basic	Atherton	(Horwood)
2	(6)	Commodore 64 Programmer's Reference Guide	Commodore	(Commodore)
3	(—)	Advanced Graphics on the ZX Spectrum	Angell and Jones	(Macmillan)
4	(4)	Complete Spectrum Rom Disassembly	Logan and O'Hara	(Melbourne House)
5	(5)	The BBC Micro Book: Basic, Sound and Graphics	McGregor and Watt	(Addison-Wesley)
6	(—)	Assembly Language Programming for the BBC Micro	Birnbaum	(Macmillan)
7	(—)	Forth on the BBC Microcomputer	de Grandis-Harrison	(Acornsoft)
8	(10)	30 Challenging Games for the BBC Micro	Hartnell	(Interface)
9	(—)	Programming the 6502	Zaks	(Sybex)
10	(8)	Commodore 64 Machine-code Master	Lawrence and England	(Sunshine)

(Figures compiled by Watford Technical Books, Watford 0923 23324)
(Last week's position in brackets)

Vic20

1	(1)	Arcadia	(Imagine)
2	(6)	Grid Runner	(Llamasoft)
3	(2)	Wacky Waiters	(Imagine)
4	(3)	Sky Hawk	(Quicksilva)
5	(10)	Panic	(Bug-Byte)
6	(—)	Matrix	(Llamasoft)
7	(5)	Catcha Snatcha	(Imagine)
8	(8)	Cosmic Cruncher	(Commodore)*
9	(9)	Frantic	(Imagine)
10	(—)	Asteroids	(Bug-Byte)

*Cartridge
(Figures compiled by Boots & Co London)

GROUCHO OUT NEXT WEEK

MY NAME IS UNCLE GROUCHO YOU WIN A FAT CIGAR is the annual Automata big - prize computer entertainment. Many thanks to all Pimaniacs for being so patient and making it all worth while. "GROUCHO". for 48K ZX Spectrum @ £10 Free Heavy Metal single on its backside by Lady Clair Sinclive and the PiMen. Release date October 12th 1983 Competition closes June 1st 1984 Winner will be announced on this page July 4th 1984 GET READY PIMANIACS